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01/22/03

TECHNICAL PLANS AND SPECIFICATIONS

MCCORMICK & BAXTER CREOSOTING COMPANY
PORTLAND, OREGON

SEDIMENT CAP

January 22, 2003

Prepared for:

STATE OF OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
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USEPA SF



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McCormick & Baxter Sediment Cap Project Tasks

1. General
 - 1.a. Mobilization/demobilization, general
 - 1.b. Construction operations plan, contractor site safety plan, and all other submittals
 - 1.c. Clearing, grubbing, debris removal; includes large woody debris (LWD) salvage
 - 1.d. Dock remnant, associated bulkhead removal
2. Piling Removal
3. In-water/shoreline surveys for sediment cap
 - 3.a. Pre-construction
 - 3.b. Post-construction
4. Excavation
 - 4.a. Bank
 - 4.b. Structural (nearshore)
5. Sediment cap
 - 5.a. Railroad pier fill
 - 5.b. Organoclay fill
 - 5.c. Sediment cap fill
 - 5.d. Armoring:
 - 5.d.1. ACB
 - 5.d.2. 6-inch minus cobble
 - 5.d.3. 3/8-inch minus gravel overlay on ACB
6. Upland work
 - 6.a. Survey
 - 6.b. Monitoring wells
 - 6.b.1. Abandonment
 - 6.b.2. Installation
 - 6.b.3. Modification
 - 6.c. Upland treatment
 - 6.c.1. Geotextile demarcation
 - 6.c.2. Growing medium
 - 6.c.3. Vegetation
 - 6.c.4. TRM

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**DIVISION 1
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SECTION 01005
ABBREVIATIONS AND DEFINITIONS

PART 1 GENERAL

1.1 ABBREVIATIONS

- A. Whenever the following abbreviations are used in these contract documents, they are to be construed the same as the respective expressions represented:

1. AASHTO American Association of State Highway and Transportation Officials
2. AC Asphalt Concrete
3. ACB Articulated(ing) Concrete Block
4. ACI American Concrete Institute
5. ACM Asbestos-Containing Materials
6. ACZA Ammoniacal Copper Zinc Arsenate
7. AISC American Institute of Steel Construction
8. ANSI American National Standards Institute
9. API American Petroleum Institute
10. ASTM American Society for Testing and Materials
11. AWS American Welding Society
12. AWWA American Water Works Association
13. bgs below ground surface
14. BNRR Burlington Northern Railroad
15. BNSF Burlington Northern Santa Fe Railroad
16. CD compact disk
17. CERCLA Comprehensive Environmental Response Compensation, and Liability Act Superfund (1980)
18. CFR Code of Federal Regulations
19. cm centimeter
20. CM construction manager
21. CO Contracting Officer
22. COP Construction Operations Plan
23. CPAH carcinogenic polycyclic aromatic hydrocarbons
24. CPR cardiopulmonary resuscitation
25. CRD Columbia River Datum
26. CSSP Contractor Site Safety Plan
27. DAS Oregon Department of Administrative Services
28. DEQ Oregon Department of Environmental Quality
29. DMEF Dredged Material Evaluation Framework
30. DNAPL dense non-aqueous phase liquid
31. E & E Ecology and Environment, Inc.
32. EM Engineering Manual of the Department of the Army, Corps of Engineers
33. EPA United States Environmental Protection Agency
34. FAR Federal Acquisition Regulation
35. FGCS Federal Geodetic Control Subcommittee
36. FWDA Former Waste Disposal Area
37. gpd gallons per day

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38.	gpm	gallons per minute
39.	I	hydraulic gradient
40.	IDW	investigation-derived waste
41.	K _H	Hydraulic Conductivity
42.	lf	linear feet
43.	m	meter
44.	ug/l	micrograms per liter
45.	mg/kg	milligrams per kilogram
46.	mm	millimeter
47.	MUTCD	Manual on Uniform Traffic Control Devices
48.	MW	monitoring well
49.	NAPL	non-aqueous phase liquid
50.	NEC	National Electric Code
51.	NGS	National Geodetic Survey
52.	NGVD	National Geodetic Vertical Datum
53.	NIOSH	National Institute for Occupational Safety and Health
54.	NPDES	National Pollutant Discharge Elimination System
55.	NPL	National Priority List
56.	OAR	Oregon Administrative Rules
57.	ODOT	Oregon Department of Transportation
58.	OHW	ordinary high water
59.	OSHA	Occupational Safety and Health Administration
60.	OVA	organic vapor analyzer
61.	OWRD	Oregon Water Resources Department
62.	PAHs	polycyclic aromatic hydrocarbons
63.	PCP	pentachlorophenol
64.	PCSCU	polymer-coated sulfur-coated area
65.	ppm	parts per million
66.	psi	pounds per square inch
67.	psig	pounds per square inch, gauge
68.	QA/QC	Quality Assurance/Quality Control
69.	RA Area	Remedial Action Area
70.	RCRA	Resource Conservation and Recovery Act (as amended)
71.	RD	remedial design
72.	ROW	right-of-way
73.	SDB	Small Disadvantaged Business
74.	sec	second
75.	sf	square foot
76.	SOP	Standard Operating Procedure
77.	SVOCs	semivolatile organic compounds
78.	TCLP	Toxicity Characteristic Leaching Procedure
79.	TFA	Tank Farm Area
80.	TRM	turf reinforcement mat
81.	TSD	Treatment, Storage, or Disposal facility
82.	TVS	total volatile solids
83.	UBC	Uniform Building Code
84.	UPC	Uniform Plumbing Code

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- | | | |
|-----|-------|--------------------------------------------|
| 85. | USCS | Unified Soil Classification System |
| 86. | USDOT | United States Department of Transportation |
| 87. | USGS | United States Geological Survey |
| 88. | VOCs | Volatile Organic Compounds |

1.2 **DEFINITIONS**

A. These definitions are made for the purposes of this contract only.

1. Agreement - The written contract between DAS and Contractor covering the Work to be performed; Contract Documents are attached to the Agreement and made part thereof as provided therein.
2. Backfill - Replacement of excavated material with suitable material compacted as specified.
3. Bid - The offer of a bidder on the prescribed forms to perform the Work and to furnish the labor and materials at the prices quoted.
4. Bid Bond - The security furnished with a bid to guarantee that the Bidder will enter into the Contract if his bid is accepted.
5. Capacity - The capacity to perform the Work, including ability to comply with the specified delivery schedule.
6. Change Order - A written order signed by the STATE, and not requiring Contractor's consent, which directs the Contractor to make a change in the Work.
7. Construction/Construction Activities - All Contractor activities specified by this contract or as required to carry out the Work.
8. Contract Documents - The Agreement, Addenda (which pertain to the Contract Documents), Contractor's Bid and Supplements as attached to the Agreement, the Notice to Proceed, the Bonds, the Technical Specifications, all Drawings, together with all written amendments, modifications, change orders, STATE's written interpretations and clarifications issued on or after the effective date of the Agreement. As used therein, the terms "division," "section," and "paragraph" refer to these divisions, sections, and paragraphs of the Contract Documents.
9. Contract Modification - A document that is signed by the Contractor and the STATE and authorizes an addition, deletion, or revision in the Work, or an adjustment in the contract price or contract times.

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ABBREVIATIONS AND DEFINITIONS

10. Contract Price - The Total Not-to-exceed Amount included in the Agreement. It may not be changed except as specified in the Sample Contract.
11. Contract Time, Contract Period, and Construction Period - The number of working days or calendar days allowed for completion of the Contract, including authorized time extensions.
12. Contractor - The individual, firm, partnership, or corporation or other business entity that contracts with STATE to furnish labor and materials or both at the project or otherwise in connection with the project.
13. Contractor Acquired Property - Property procured or provided by the Contractor for the performance of the Contract, title to which is vested in the STATE.
14. Credit - The adequacy of financial resources which must finance the costs of work until payment is received.
15. Day - Unless otherwise specified, day(s) shall mean Calendar Day(s).
 - a. Business Day: Any day other than Saturday, Sunday, or Holiday.
 - b. Calendar Day: The time period of twenty-four hours measured from midnight to the next midnight.
 - c. Non-Working Day: The following are Non-Working Days:
 1. Saturday
 2. Sunday
 3. Holiday
 4. A day upon which the Engineer issues a suspension order.
 5. A day in which the Contract specifically requires the Contractor to suspend the Work.
 - d. Working Day: A day not otherwise defined as a Non-Working Day.
 - e. Unworkable Day: A partial or whole day the Engineer in his sole opinion declares to be unworkable because of unusually severe weather, or another condition beyond the control of the Contractor that prevents satisfactory and timely performance of the Work, when such performance, if not hindered, would have otherwise progressed toward completion of the Work.
16. Design Professional - Ecology and Environment, Inc., the corporation who prepared the technical Specifications and Drawings. The term includes the authorized representatives of the design professional, its consultants approved by the STATE, or any successor or other firm or person designated by the STATE to act in the same capacity.
17. Drawings - The approved Drawings, profiles, typical cross sections, working drawings and supplemental drawings, or exact reproductions

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ABBREVIATIONS AND DEFINITIONS

thereof, which show the location, character, dimensions, and details of the work to be done.

18. Engineer - The authorized representative of the STATE, who will be present on site as the principal point of contact, and will be assigned to make detailed inspections of any and all portions of the Work. The term Engineer is defined as Ecology and Environment, Inc. (E & E), 368 Pleasant View Drive, Lancaster, New York 14086, with principal office at: 333 SW Fifth Ave., Portland, Oregon, 97204. All engineering work will be under the supervision of an engineer currently licensed in the State of Oregon.
19. Equipment - All machinery and equipment with the necessary supplies for upkeep and maintenance; also tools and apparatus necessary for the proper construction and acceptable completion of the Work.
20. Hazardous Waste - Solid waste classified as hazardous according to the Resource Conservation and Recovery Act Amendments (1984) and guidelines thereto.
21. Invitation to Bid - The advertisement for bids for all work or materials on which bids are required.
22. Key Personnel - Refers to the team of professionals outlined in the key personnel section in the Invitation to Bid.
23. Latent Defect - A defect that could not reasonably be expected to discover by normal methods of inspection.
24. Materials - Any substances specified for use in the project and its appurtenances.
25. Notice to Proceed - Written authorization by DAS for the Contractor to begin work.
26. Off Site - Outside the legal property boundary of the site.
27. Patent Defect - A defect discovered by normal inspection methods.
28. Pay Item - A specifically described unit of work for which a price is provided on the Bid Form.
29. Payment Bond - The approved form of security furnished by the Contractor and his surety as a guaranty that he will pay employees, subcontractors, and suppliers who have provided labor, equipment, material or services related to this contract.

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30. Performance Bond - The approved form of security furnished by the Contractor and his surety as a guaranty that he will execute the Work in accordance with the terms of the Contract.
31. Progress Reports - Submittals by the Contractor showing progress and up-to-date status of the project and anticipated variances both in work and finances.
32. Project Completion - When all the work required by the Contract Documents is complete and all required paperwork is final. The only item remaining before the contract is closed is the receipt of final payment by the Contractor.
33. Project Manager - The person who has ultimate responsibility for the quality of the work and control of the budget. The Contractor will have a project manager as will Ecology and Environment, Inc. The State will also have a project manager, but his/her duties and responsibilities may differ from those defined herein.
34. Project/Project Work - Any and all work specified herein, including any associated site improvements and appurtenances and structures to be constructed. The project is more fully described elsewhere in the Contract Documents, including the Agreement.
35. Replacement - Installation of a like element in the same or near-same physical location to function in place of an existing element normally due to damage, wear, or obsolescence of the element.
36. Restoration - All work necessary to replace, repair, or otherwise reestablish the right-of-way or private property and all features contained within it to the same or equal condition as it existed prior to any change or construction therein.
37. Right-of-Way - Land, property, or property interest, usually in a strip, acquired for or devoted to transportation purposes.
38. Responsiveness - A bid's conformity with, and commitment to meet, the material terms of an invitation for bids.
39. Shall - The word "shall" means "mandatory performance by the contracted party" to the task referred to and accompanying this word.
40. Site Entrance - The dirt road parallel to the railroad track located between the end of N. Edgewater Street and the site gate.
41. Site Superintendent - Representative of the Contractor who shall be present on site during all Contractor activities and serve as principal point of

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contact, and who will be responsible for directing and overseeing all aspects of Contractor's work.

42. Site/On Site - Any area on the McCormick and Baxter property or the associated offshore area.
43. Staging Area - Designated areas shown on the drawings to be used by the Contractor for temporary or long-term storage of construction equipment, materials, soil or gravel stockpiles, landscaping elements, and other items necessary to complete the Work.
44. STATE - Prior to contract award, STATE refers to the State of Oregon Department of Administrative Services. After contract award, STATE refers to the State of Oregon, Department of Environmental Quality, whose mailing address is 811 SW Sixth Ave., Portland, Oregon, 97204; includes its designated representatives and its successors and assigns.
45. Subcontractor - Any individual, partnership, firm, corporation, or other business entity that has a contractual relationship with the Contractor to furnish labor or materials or both in connection with the Work of the Contractor and those who contract with the subcontractor to furnish labor or materials or both in connection with the work of the subcontractor. There is no contractual relationship between STATE and any subcontractor, but each subcontractor shall be required by the party with whom it contracts to agree to comply with these Contract Documents.
46. Subgrade - The top surface of the roadbed on which subbase, base, surfacing, pavement, or layers of similar materials are placed.
47. Substantial Completion - The Work has progressed to the point where it is sufficiently complete that it can be utilized for its intended purpose.
48. Subsurface Features - Manmade features below existing grade or water surface including, but not limited to: utilities, pipelines, drain lines and drains, wells, building foundations, footings, pilings, bridge piers, or riprap.
49. Support Areas - Non-contaminated areas, approved for use by the Engineer that may be used by the Contractor for office and administrative functions, and parking of employee vehicles.
50. Surety - The corporation, partnership, or individual, other than the Contractor, executing the Bid and Performance Bonds.
51. Utility - The privately, publicly, or cooperatively owned lines, facilities, and systems for producing, transmitting, or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm-water, not connected with on-site drainage, and other similar commodities,

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including publicly owned fire and police signal systems and street lighting systems, which directly or indirectly serve the public or any part thereof. The term "utility" shall also mean the utility company, inclusive of any wholly owned or controlled subsidiary.

52. Work - Furnishing all labor, materials, tools, equipment, supplies, services, and supervision necessary to complete all activities required by these Contract Documents.

PART 2 PRODUCTS

[Not Used]

PART 3 EXECUTION

[Not Used]

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. This section describes project site location, site background, and scope of work.

1.2 RELATED SECTIONS

- A. Section 00890: Previous Studies

1.3 REFERENCES

[Not Used.]

1.4 SITE LOCATION AND DESCRIPTION

- A. The McCormick and Baxter Creosoting Company, Portland Plant site (McCormick & Baxter or site) covers approximately 58 acres of terrestrial and aquatic land located on the east bank of the Willamette River (near river mile 7) in Portland, Oregon (see Drawings). The site is downstream of Swan Island and upstream of St. John's Bridge. The site is situated on a terrace of imported sand fill (dredged material placed in the early 1900s) located within the floodplain of the Willamette River.
- B. The site encompasses approximately 43 acres on land and 15 acres in the river. The upland area is generally flat and lies between a 120-foot-high bluff along its northeastern border and a 20-foot-high bank along the Willamette River to the southwest. A sandy beach is exposed at the base of the bank except during periods of high river stage (generally late winter or early spring). The site is bordered near the river by industrial properties and on the bluff by a residential area. A Burlington Northern Santa Fe Railroad (BNSF) spur crosses the northern portion of the property and the Union Pacific Railroad (UPRR) borders the site to the east below the bluff. The entire perimeter of the property is fenced, and warning signs are posted on the fence.
- C. The current configuration of the McCormick & Baxter property is shown on the Drawings. The property is accessed via the partially-paved North Edgewater Street which leads from Willamette Boulevard to the main gate near the northwest corner of the site. The driveway leading into the property and the parking lot are paved; the remainder of the property is unpaved, covered with gravel, or vegetated. Two construction trailers are maintained in the parking lot area to provide office space, storage, and personnel decontamination facilities for ongoing site activities. The remaining above ground structures on site include: a former shop building that is used to house a water treatment system (no longer in operation) and other equipment/supplies; a freight container located near the western property corner, also used to house a water treatment system (no longer in operation); four above ground tanks used for water treatment operations; a small

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SUMMARY OF WORK

metal shed containing a water service backflow prevention device; several utility poles; and a wood retaining wall and pilings along the river bank. All other above ground structures and buildings were removed during previous Remedial Action (RA) activities. Below ground features existing on site include: utility lines and services, as described in Part 1.4.D, below; 2" and 4" steel outfall piping previously used for treatment system discharge; a former concrete butt tank, whose walls have been removed to approximately four feet bgs; and a buried concrete debris area, where concrete debris from previous demolition activities was placed.

- D. Utility service to the site includes water provided by the City of Portland to the shop building, decontamination pad, and several fire hydrants. Electrical service is provided by Portland General Electric Company to the site trailers and former shop building, as well as to security lights mounted on several overhead poles. Two pressurized sewer lines and a natural gas line are located on the west side of the site adjacent to the BNSF tracks. One combined sewer line is located on the south side of the site adjacent to the adjoining property. Underground telephone lines are located near the paved entrance area, however telephone service to the site no longer exists due to recent fire damage. The locations of utilities are indicated on the Drawings. The locations are believed to be correct but are not guaranteed.

1.5 SITE BACKGROUND

- A. McCormick & Baxter was founded in the early 1940s to produce a variety of treated wood products during World War II. Various wood treatment processes have been used at the facility including pentachlorophenol (PCP), creosote formulations, ammoniacal copper/zinc arsenate, copper/chromium/arsenic formulation, and Cellon. Site investigation between 1983 and 1990 revealed many releases of chemical compounds to soil, groundwater, and sediment. Contaminants detected at the site include polycyclic aromatic hydrocarbons (PAHs, comprising about 85 percent of creosote constituents), PCP, arsenic, chromium, copper, and zinc. In 1990, the wood treatment operations ceased and early remedial actions were initiated to remove process equipment, piping tanks, treatment formulations, etc.
- B. The site is presently listed as a Superfund site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Over the past several years, a number of inspections, investigations, and remedial actions have been performed at the site. Notably, Phase I of the soil remedy was performed in 1999, where the most highly contaminated soil was excavated to 4 feet bgs and disposed off-site as hazardous waste. Clean, sandy fill was placed in those areas that were excavated. The removal summary report for this action as well as other site inspections, investigations, and remedial actions are referenced in Section 00890 of these Contract documents, and shall be made available for Contractor's review. A vertical barrier wall, as shown on the Drawings, is being installed. It is comprised of two materials: steel sheet pile for the portion that is

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SUMMARY OF WORK

adjacent to the Willamette River and soil-bentonite slurry for the remaining portion.

- C. The site is currently inactive; however, investigation, monitoring, and remedial activities are performed at the site on an on-going basis.

1.6 SCOPE OF WORK

- A. The scope of work for this project includes removal of pilings and dolphins within the sediment cap boundaries, demolition of the dock remnant, installation of the sediment cap, and regrading and vegetation of the upland bank and greenway area.
- B. NAPL seeps and a hot spot are to be covered with organoclay. The Willamette Cove seep shall be excavated and filled with organoclay as shown on the Drawings. The excavated sediment will need to be disposed of at a RCRA Subtitle "C" facility.
- C. The cap material shall be placed to the areas and thicknesses shown on the Drawings. The armoring layer is comprised of two materials: articulated concrete block in the shallower areas and armorstone at the deeper areas of the cap.
- D. The upland bank will be regraded to ensure its stability. The excavated soil will be tested to determine if it is below action levels and, as such, may be left on site. Soil at or above the action level will need to be disposed of at a RCRA Subtitle "C" facility.
- E. The upland bank regrade varies in cross-section across the site to provide diversity for habitat. A terrace is incorporated into the slope. The slope will be protected by installation of a TRM. The limit of the upland work, including revegetation, extends approximately 130 feet from ordinary high water.
- F. The Contractor shall protect the environment and existing utilities in accordance with this Contract.
- G. The Contractor shall dispose of all waste materials including waste soil, water, personnel protective equipment, etc., in accordance with this Contract.
- H. The Contractor shall abandon specific monitoring wells in accordance with Oregon Water Resource Department regulations and a DEQ approved work plan. All other monitoring wells shall be protected.
- I. The Contractor shall monitor the in-water work to ensure water quality is not impacted per the Contract requirements.

END OF SECTION

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SECTION 01025
MEASUREMENT AND PAYMENT

To be completed at a future date.

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SECTION 01200
PRECONSTRUCTION AND PROJECT MEETINGS

PART 1 GENERAL

1.1 SUMMARY

- A. The purpose of the preconstruction meeting is to review Contract requirements; establish a detailed schedule of operations; discuss the Contractor's safety rules and regulations and the Contractor's Site Safety Plan; discuss material handling; introduce various members of the Contractor's, STATE's, and Engineer's staffs; and resolve any questions raised by either party.
- B. The purpose of project meetings is to review requests for payment; review job progress; resolve problems that may arise; discuss any accidents or near accidents since the last meeting; and address any other matters of concern to either party.

1.2 REFERENCES

[Not used.]

1.3 NATURE OF MEETINGS

- A. The meetings specified herein are formal in nature and should be attended by both the Contractor's and Engineer's project managers and the key technical personnel. STATE personnel also may attend these meetings.
- B. Unless requested otherwise by the Engineer, the Contractor's site superintendent (primary site representative) should attend the preconstruction and project meetings.
- C. Nothing in this section should preclude the usual informal meetings held daily between the Contractor's and Engineer's staffs.

1.4 DOCUMENTATION

- A. The Engineer shall prepare a summary of each meeting within 2 working days of the meeting, especially noting any decisions made, and shall deliver a copy of same to the Contractor and STATE.
- B. The Contractor shall review the summary of the meeting and immediately inform the Engineer if it believes the summary is not totally accurate. Failure to inform the Engineer of any inaccuracies within 4 working days of the meeting shall indicate the Contractor's concurrence with the summary of the meeting.

1.5 SCHEDULING MEETINGS

- A. The Engineer shall schedule the preconstruction meeting shortly after the formal Award of Contract.

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PRECONSTRUCTION AND PROJECT MEETINGS

- B. Project meetings shall be held on the construction site at a minimum of once per week, on a day and at a time mutually agreeable to all parties.
- C. Either party, with adequate advance notice, may request a meeting not otherwise scheduled.

1.6 LOCATION OF MEETINGS

- A. The Engineer will arrange for the location of the preconstruction meetings.
- B. Normally, all other meetings will occur at the site field trailers.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

[Not used.]

END OF SECTION

SECTION 01220
DISSEMINATION OF PROJECT INFORMATION

PART 1 GENERAL

1.1 SCOPE

- A. This section covers mandatory requirements concerning release of project information.
- B. All Contractor personnel, subcontractor personnel, and suppliers shall be made aware of the requirements of this section.

1.2 REFERENCES

[Not Used]

1.3 ROLE OF THE STATE AND ENGINEER

- A. The STATE will have responsibility for disseminating project information to the public or local agencies.
- B. The Contractor shall refer any substantive questions to the Engineer.
- C. In particular, the following data are to be considered confidential and shall not be released by anyone except the STATE:
 - 1. Results of any tests.
 - 2. Interpretation of test results.
 - 3. Changes to the Contract.
 - 4. Any hazard or risk assessment.
 - 5. The rationale for, or requirements of, the project or any of its components.

1.4 ROLE OF THE CONTRACTOR

- A. Any substantive questions from property owners; federal, local, or other state agencies; tribes; or the general public, and any questions from any news media shall be referred to the STATE.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

[Not used.]

END OF SECTION

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SECTION 01300
CONTRACTOR SUBMITTALS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. The Contractor shall submit to the Engineer for review plans, shop drawings, test reports, data on materials and equipment, and material samples as required for the proper control of work.
- B. The Contractor shall note that there are specific requirements for submittals to the Engineer and/or STATE in other sections of these Specifications. The sections and associated submittal items are outlined in Table 01300-1, attached at the end of this section.
- C. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting.

1.2 RELATED REQUIREMENTS

- A. In addition to the requirements for submittals to the Engineer described in this section, the Contractor also is responsible for submittals to local, state, or federal agencies that may be needed for completion of the Work.

1.3 SHOP DRAWINGS

- A. When used in the Contract Documents, the term "shop drawings" shall be considered to mean Contractor's plans for material and equipment, which become an integral part of the Project. These drawings shall be complete and detailed. Shop drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, bills of material, and inspection and test reports including performance curves and certifications as applicable to the work.
- B. All details on shop drawings submitted for approval shall show clearly the elevations of the various parts to the main members and lines of the structure. Where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the shop drawings before being submitted for approval.

1.4 PRODUCT DATA

- A. Product data as specified in individual sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliance and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection

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CONTRACTOR SUBMITTALS

and test reports and certifications, mill reports, and printed product warranties, as applicable to the Work.

1.5 SAMPLES

- A. The Contractor shall furnish for review and approval of the Engineer samples required by the Contract Documents or requested by the Engineer. Samples shall be delivered to the Engineer as specified or directed and in quantities and sizes as specified. The Contractor shall pre-pay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the Engineer.
- B. The Contractor shall prepare a transmittal letter for each shipment of samples. He shall enclose a copy of this letter with the shipment. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.

1.6 SUBMITTAL REQUIREMENTS

- A. The Contractor shall review, approve, and submit, with reasonable promptness so as to cause no delay in the Contract Work or in the work of the STATE or any separate contractor, all submittals as may be required.
- B. The Contractor shall submit four (5) copies of all submittals. The Engineer will retain one (1) set, forward two (2) sets to the STATE, and return two (2) sets to the Contractor with appropriate review comments. The Engineer will review the submittal and return to the Contractor the set of marked-up copies with appropriate review comments. One set of approved shop drawings shall be maintained on site at all times.
- C. All submittals shall be made directly to the Engineer. The appropriate address will be delivered at the pre-construction meeting.
- D. Plans, shop drawings, and samples shall be furnished with the following information:
 - 1. Title.
 - 2. Date.
 - 3. Name of contractor, subcontractor, and manufacturer submitting information.
 - 4. Clear identification of contents, location of the work, and the Specification section numbers where the product is found in the Contract Documents.
 - 5. Contractor Certification Statement as defined below.
 - 6. Submittal Identification Number.
 - 7. Contract Drawing Number Reference (if applicable).
- E. In accordance with subparagraph 1.7.A, each plan, shop drawing, sample, and catalog data submitted by the Contractor shall have affixed to it the following

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Certification Statement, signed by the Contractor: "Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contractor requirements."

- F. Items specified are not necessarily intended to be a manufacturer's standard product. Variations from specified items will be considered on an "or equal" basis. If submittals show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal and on the shop drawings along with notification of his intent to seek contract adjustment. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed. Variations submitted but not described may be cause for rejection. Any variations initiated by the Contractor will not be considered as an addition to the scope of work unless specifically noted and then approved as such in writing by the STATE.
- G. Data on materials and equipment shall include materials and equipment lists giving, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, material, size, finish, and all other pertinent data.

1.7 CONTRACTOR'S RESPONSIBILITY

- A. It is the duty of the Contractor to check, and coordinate with the work of all trades, all drawings, data, schedules and samples prepared by or for him before submitting them to the Engineer for review. Each and every copy of any drawing or data sheet larger than 11" x 17" shall bear Contractor's Certification Statement showing that they have been so checked and approved. Drawings or data sheets 11" x 17" and smaller shall be bound together in an orderly fashion and bear the Contractor's Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a list of all sheet numbers within the package. Shop drawings submitted to the Engineer without the Contractor's Certification Statement will be returned to the Contractor, without review at the Engineer's option, for non-conformance with this requirement.
- B. The Contractor shall review shop drawings, product data, and samples prior to submission to determine and verify the following:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Manufacturer's catalog numbers and similar data.
 - 4. Conformance with Specifications.

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CONTRACTOR SUBMITTALS

- C. Shop drawings shall clearly indicate any deviations or variations in the submittal from the requirements of the Contract Documents.
- D. Within seven (7) calendar days after the Date of Notice to Proceed, the Contractor shall furnish the Engineer a Submittal Schedule fixing the respective dates for the initial submission of submittals, testing and installation of materials, supplies and equipment as applicable. This schedule must be compatible with the Master Schedule specified in Section 00801. The Contractor shall prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work sections of the Specifications, so that the installation will not be delayed by processing times including disapproval and re submittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit complete and acceptable submittals sufficiently in advance of the work.
- E. The Contractor shall not begin any work affected by a submittal returned not approved until a revision or correction of the submittal has been resubmitted and returned approved or approved as noted. Any corrections made to the submittals are to be followed without exception.
- F. The Contractor shall submit to the Engineer all shop drawings and data sufficiently in advance of applicable construction requirements and/or activities to provide no less than five (5) working days for review from the time the Engineer receives them.
- G. The Contractor shall be responsible for and bear all cost of damages that may result from the ordering of any material or from proceeding with any part of work prior to the review and approval by the Engineer of the necessary submittals.
- H. All shop drawings, product data, and samples submitted by subcontractors for approval shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission according to the approved submittal schedule so as to prevent delays in delivery of materials and project completion.
- I. The Contractor shall check all subcontractor's shop drawings, product data, and samples regarding measurements, size of members, materials, and details to satisfy himself that they are in conformance to the Contract Documents. Submittals found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission to the Engineer.

1.8 ENGINEER'S REVIEW OF SUBMITTALS

- A. The Engineer's review is for general conformance with the design concept and Contract Documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the Contract Documents or for departures

SECTION 01300
CONTRACTOR SUBMITTALS

therefrom. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.

- B. The review of Contractor submittals will be general. They shall not be construed:
 - 1. As permitting any departure from the Contract requirements;
 - 2. As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
 - 3. As approving departures from details furnished by the Engineer, except as otherwise provided herein.
- C. If the submittals describe variations and show a departure from the Contract requirements that the Engineer finds to be in the interest of the STATE and to be so minor as not to involve a change in Contract Price or Time for performance, the Engineer may return the reviewed drawings without noting an exception.
- D. Approval/disapproval designations for submittals will be identified by the Engineer.
- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Engineer on previous submissions. Any such revisions that are not clearly identified shall be made at the risk of the Contractor. The Contractor shall make corrections to any work done because of this type revision that is not in accordance to the Contract Documents as may be required by the Engineer and/or the STATE.
- F. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the Engineer and STATE of at least five (5) working days prior to release for manufacture.
- G. The Engineer will review a submittal/resubmittal a maximum of three (3) times after which cost of review will be borne by the Contractor. The cost of engineering shall be equal to the Engineer's charges to the STATE under the terms of the Engineer's agreement with the STATE.
- H. When the plans and shop drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.
- I. Partial submittals may not be reviewed. The Engineer will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the

SECTION 01300
CONTRACTOR SUBMITTALS

Contractor. The Engineer may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

[Not used.]

END OF SECTION

**TABLE 01300-1
SUBMITTAL CHECKLIST**

Section	Item/Description	Required Submittal Date	Date Submitted	Comments
01300	Submittal Schedule	7 calendar days after Notice to Proceed		
01310	Construction Schedule	7 calendar days after Notice to Proceed		
01310	Progress Schedules	Weekly during construction		
01320	Construction Operations Plan (COP) and Checklist (see Section 01320 for submittal items to be included in the COP)	21 calendar days after Notice to Proceed		
01330	Contractor Site Safety Plan (CSSP)	7 calendar days after Notice to Proceed		
01330	Health and safety summary reports	Weekly during construction		
01450	Contractor Quality Control Plan (CQCP)	21 calendar days after Notice to Proceed		
01450	Record of Corrective Actions	On going		
01450	Field Inspection Notebooks	At completion of work		
01700	Log books; Contract closeout letters/certifications	At completion of work		
02120	Disposal receipts	30 days after removal and disposal activities		
02140	Copy of survey field notebook, reduced survey notes, calculations, etc.	21 calendar days after performance of survey work		
02140	Record drawings	21 calendar days after completion of work		
02145	Copy of survey field notebook, reduced survey notes, calculations, etc.	21 calendar days after completion of work		
02145	Record drawings	21 calendar days after completion of work		
02200	Import materials samples and test results	7 calendar days prior to excavation activities		
02200	Qualifications of testing laboratory	7 calendar days prior to excavation activities		
02210	Import materials samples and test results	7 calendar days after submitting COP		
02210	Qualifications of testing laboratory	7 calendar days after submitting COP		
02220	Material samples and test results	14 calendar days after submitting COP		

Table 01300-1

**TABLE 01300-1
SUBMITTAL CHECKLIST**

Section	Item/Description	Required Submittal Date	Date Submitted	Comments
02230	Material test results and qualifications of testing laboratory	14 calendar days after submitting COP		
02270	Material samples and test results	14 calendar days prior to beginning upland work		
02270	Product specifications, test results, and qualifications of testing laboratory	14 calendar days prior to beginning upland work		
02270	Proposed vegetation list	14 calendar days prior to beginning upland work		
02280	Stockpile locations	Prior to stockpile construction		
02400	Product specifications, certificates, test results, qualifications of testing laboratory, and installation instructions	14 calendar days prior to installation of ACB		
02610	Monitoring Well Construction Notices (Start Cards)	Prior to well abandonment work		
02610	Monitoring Well Report (Monitoring Well Log)	21 calendar days after the completion of monitoring well abandonment		
02620	Monitoring Well Construction Notices (Start Cards)	7 calendar days prior to constructing wells		
02620	Monitoring Well Report (Monitoring Well Log)	21 calendar days after completion of monitoring well installation		
02630	Shop drawings, product information, and construction method	Prior to installation		

PART 1 GENERAL

1.1 SUMMARY

- A. Prepare a detailed construction schedule for the site work with sub-schedules of related activities that are essential to the construction process.
- B. Revise the detailed construction schedule on a weekly basis and as requested by the Engineer.

1.2 REFERENCES

[Not used.]

1.3 SUBMITTALS

- A. Submit the detailed construction schedule to the Engineer and STATE within seven (7) calendar days after Notice to Proceed. If this date falls on a weekend or holiday, the submittal date shall be the next non-holiday or non-weekend day.
- B. Submit revised weekly progress schedules to the Engineer and STATE for review.

1.4 FORM OF SCHEDULES

- A. Prepare Construction Progress and Submittal schedules in the form of a critical path method horizontal bar chart.
 - 1. Provide separate horizontal bar for each trade or operation within each structure or activity.
 - 2. Horizontal time scale: In days from start of construction.
 - 3. Scale and spacing: To allow space for notations and future revisions.

1.5 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:
 - 1. Show the complete sequence of construction by activity.
 - 2. Show the dates for the beginning of, and completion of, each activity, including major milestones.
 - 3. Show projected percentage of completion for each item, as of the first day of each week.
 - 4. Identify key activities for subcontractors.
 - 5. Show calendar days as well as on-site field days.
- B. Submittals Schedule in accordance with Section 01300. Show:
 - 1. The dates for Contractor's submittals.
- C. A typewritten list of all long lead items (equipment, materials, etc.)

SECTION 01310
CONSTRUCTION SCHEDULES

1.6 SCHEDULE REVISIONS

- A. Indicate progress of each activity up to the date of submission.
- B. Show changes occurring since previous submission of schedule:
 - 1. Major changes in scope.
 - 2. Activities modified since previous submission.
 - 3. Revised projections of progress and completion.
 - 4. Other identifiable changes.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

[Not used.]

END OF SECTION

PART 1 GENERAL

1.1 REQUIREMENTS

- A. The Contractor shall provide to the Engineer a Construction Operations Plan (COP). The COP shall identify personnel, equipment, construction procedures, and construction quality control to be used in carrying out the requirements of this project.

1.2 CONTENTS OF THE COP

- A. The Construction Operations Plan shall outline the overall construction sequencing and procedures to be followed during the site work activities. The plan shall contain a thorough and concise summary of how the work will be accomplished, and shall include at a minimum:
1. *Technical Approach.* The technical approach shall include general work procedures and means and methods to accomplish all work activities discussed in the technical specifications.
 2. *Quality Control/Quality Assurance.* The Contractor shall describe the general quality control and quality assurance procedures, methods, and tests to be implemented to achieve compliance with the project requirements, plans, and specifications described herein. A Contractor Quality Control Plan (CQCP) is specified in Section 01450. It is to be submitted with the COP.
 3. *Construction Operations Organization Chart.* This chart shall show lines of authority and responsibility. Number of personnel to be utilized on the job shall be indicated in appropriate organizational elements. If significant changes in the organization are expected to occur during the life of the project or phases of construction, these shall be discussed.
 4. *Personnel Qualifications.* Names, qualifications, and work experience of all Contractor supervisors, health and safety personnel, and employees with Quality Control responsibilities shall be provided in accordance with the Contractor's bid, where applicable. Key subcontractor personnel shall also be identified. If the personnel identified in the COP are not available at the start of the project, the Contractor shall submit, prior to mobilization, the names and qualifications of substitute personnel, with equal or more extensive experience, to the STATE for approval.
 5. *Equipment to be Utilized for the Site Activities.* All equipment to be used to complete the site work activities shall be described. In addition, the Contractor shall include maintenance, repair, and fueling procedures to be employed to ensure optimal equipment operation.
 6. *Regulatory Requirements.* Regulatory requirements applicable to the project and how compliance will be assured shall be addressed. Personnel training requirements shall be listed and compliance demonstrated. The Storm Water Pollution Prevention Plan (SWPPP) and Spill Prevention and

SECTION 01320
CONSTRUCTION OPERATIONS PLAN

Control Plan (SPCC) required by the general NPDES permit for construction shall be included in the COP.

7. *Lower Tier Contractors.* Subcontractors for all work to be subcontracted by the Contractor must be identified as well as their proposed Subcontractors.

- B. A Construction Operations Plan Checklist is attached at the end of this section to assist the Contractor with preparation of the COP. The Checklist contains, in part, references to sections that describe items to be included in the COP. At a minimum, all items listed in the Checklist shall be addressed within the COP.

1.3 SUBMITTALS

- A. Within 21 calendar days following Notice to Proceed, the Contractor shall provide the Engineer with four copies of the completed COP for review and acceptance. If this date falls on a weekend or holiday, the submittal date shall be the next non-holiday or non-weekend day.
- B. The COP submittal shall be organized in similar item-by-item fashion as outlined in Parts 1.2.A.1 through 1.2.A.7, above.
- C. A completed COP Checklist shall also be submitted with the COP.

1.4 NOTIFICATION OF CHANGE

- A. Following acceptance of the COP, the Contractor shall propose revisions to the COP at any time that the procedures or processes differ from those stated in the previously approved COP. These proposed revisions must be submitted to the Engineer, with adequate time for approval, prior to the change being instituted.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

[Not used.]

END OF SECTION

Section 01320 Attachment
CONSTRUCTION OPERATIONS PLAN CHECKLIST

Contractor Name:

Completed By:

Date:

1. TECHNICAL APPROACH: ☐ (check box if completed)

Provide construction and installation procedures, construction sequence, and means and methods to accomplish the work. At a minimum, the following items shall be included (as required by the referenced section):

<u>Section</u>	<u>Work Item</u>	<u>Check Box if Completed</u>
01450	- Contractor Quality Control Plan (CQCP)	<input type="checkbox"/>
01540	- Site security and control	<input type="checkbox"/>
01550	- Equipment decontamination	<input type="checkbox"/>
01560	- Erosion and sediment control	<input type="checkbox"/>
	- Storm Water Pollution Prevention Plan	<input type="checkbox"/>
	- Spill Prevention and Control Plan	<input type="checkbox"/>
01580	- Utility protection	<input type="checkbox"/>
01610	- Use of construction aids	<input type="checkbox"/>
01630	- Storage locations and layout	<input type="checkbox"/>
01800	- Site maintenance	<input type="checkbox"/>
02100	- Site preparation and layout	<input type="checkbox"/>
02120	- Piling removal and disposal	<input type="checkbox"/>
02140	- Surveying and staking	<input type="checkbox"/>
	- Surveyor Qualifications	<input type="checkbox"/>
02145	- Bathymetric survey	<input type="checkbox"/>
	- Surveyor Qualifications	<input type="checkbox"/>
02200	- Material and equipment storage	<input type="checkbox"/>
	- Excavation and trenching procedures	<input type="checkbox"/>
	- Excavation shoring (see Section 01610)	<input type="checkbox"/>
	- Stockpiling (see Section 02280)	<input type="checkbox"/>
	- Placement and compaction	<input type="checkbox"/>
	- Control of drainage, spills, and wastes	<input type="checkbox"/>
02210	- Material and equipment storage	<input type="checkbox"/>
	- Cap material placement procedures	<input type="checkbox"/>
	- Monitoring procedures	<input type="checkbox"/>
02220	- Material and equipment storage	<input type="checkbox"/>
	- Adsorbent cap material placement procedures	<input type="checkbox"/>
	- Monitoring procedures	<input type="checkbox"/>

02230	- Material and equipment storage	<input type="checkbox"/>
	- Cap material placement procedures	<input type="checkbox"/>
	- Monitoring procedures	<input type="checkbox"/>
02270	- Material and equipment storage	<input type="checkbox"/>
	- Bank Regrading procedures	<input type="checkbox"/>
	- TRM Placement	<input type="checkbox"/>
	- Placement of growth medium	<input type="checkbox"/>
	- Vegetation	<input type="checkbox"/>
	- Drainage and spill control	<input type="checkbox"/>
02400	- ACB placement procedures	<input type="checkbox"/>
	- Monitoring procedures	<input type="checkbox"/>
02610	- Well abandonment	<input type="checkbox"/>
02620	- Well construction	<input type="checkbox"/>

2. SITE LAYOUT PLAN: ☐ (check box if completed)

Develop site layout plan indicating the locations of all work areas; health and safety zones (see Section 01330); decontamination stations (see Section 01550); storage and staging areas (see Section 01630); piling storage areas (see Section 02120); stockpile areas (see Section 02280); field office (see Section 01610); etc.

3. QUALITY CONTROL / QUALITY ASSURANCE: ☐ (check box if completed)

These are to be part of the Contractor Quality Control Plan (CQCP) that will accompany the COP. Describe the general quality control and quality assurance procedures, methods, and tests to be implemented.

4. CONSTRUCTION OPERATIONS ORGANIZATION CHART: ☐ (check box if completed)

Develop chart showing lines of authority and responsibility. Number of personnel to be utilized on the job shall be indicated in appropriate organizational elements. If significant changes in the organization are expected to occur during the life of the project or phases of construction, these shall be discussed.

5. PERSONNEL QUALIFICATIONS: ☐ (check box if completed)

Provide names, qualifications, and work experience of all Contractor supervisors, health and safety personnel, and employees with Quality Control responsibilities in accordance with the Contractor's bid and as specified in the following Sections:

<u>Section</u>	<u>Item</u>	<u>Check Box if Completed</u>
00020	- Minimum bidder qualifications	<input type="checkbox"/>
01330	- Health & safety personnel	<input type="checkbox"/>
	- Trench work personnel	<input type="checkbox"/>
02140	- Survey instrument operator	<input type="checkbox"/>
02145	- Bathymetric survey instrument operator	<input type="checkbox"/>
02610	- Licensed monitoring well constructor	<input type="checkbox"/>
02620	- Licensed monitoring well constructor	<input type="checkbox"/>

6. EQUIPMENT TO BE UTILIZED FOR THE SITE ACTIVITIES: ☐ (check box if completed)

Describe all equipment to be used to complete the site work activities outlined in Part 1. Also include

all foreseen construction aids and descriptions of their use (Section 01610); and maintenance, repair, and fueling procedures.

7. REGULATORY REQUIREMENTS: ☐ (check box if completed)

Address regulatory requirements applicable to the project and how compliance will be assured. Personnel training requirements shall also be listed and compliance demonstrated.

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intentionally left blank.

SECTION 01330
CONTRACTOR SITE SAFETY PLAN

PART 1 GENERAL

1.1 SUMMARY

- A. Develop and submit a Contractor Site Safety Plan (CSSP) using information provided herein and in Appendix A, to be provided at the pre-construction meeting. Appendix A will be provided as information only and will have been developed for the sole use of the Engineer. The Contractor is responsible for developing and implementing its own site safety plans. The Engineer's safety plan (Appendix A) will be provided at the pre-construction meeting.
- B. Plan for, and ensure that, all personnel comply with the basic provisions of the Occupational Safety and Health Administration (OSHA) Standards (29 CFR 1910) and General Construction Standards (29 CFR 1926), including OSHA Hazardous Waste Operations and Emergency Response, Interim Final Rule (29 CFR 1910.120) (as applicable to the specific tasks). All personnel must also comply with all other applicable federal, state, or local laws and regulations. Prepare and implement a hazard communication program meeting OSHA 29 CFR 1910.1200. The responsibility for the development, implementation, and enforcement of the health and safety requirements lies solely with the Contractor and the Contractor's Industrial Hygiene Support Staff. Take all necessary precautions for the safety of, and provide the necessary protection to prevent damage, injury, or loss to:
 - 1. All personnel on the work site.
 - 2. The general public on or off the work site when hazards are created by the Contractor's operations.
- C. Remedial operations under this Contract require work in an environment where contact with hazardous chemicals may occur. Provide adequate protection for all personnel on site. Prepare a CSSP for all personnel working or visiting the site. Specific details of the minimum requirements of the CSSP are established herein.

1.2 REFERENCES

- A. 29 CFR 1910: OSHA Occupational Safety and Health Standards
- B. 29 CFR 1926: OSHA Safety and Health Regulations for Construction

1.3 FORMAT OF THE CSSP

- A. Develop a CSSP in the format specified below addressing, at a minimum, all the items specified herein. Require any employee or subcontractor personnel to read and abide by the CSSP.
- B. The format of the CSSP shall be as follows:
 - 1. Introduction

SECTION 01330
CONTRACTOR SITE SAFETY PLAN

- a. Requirements are specified in Subpart 1.5.
2. Section A - Key Personnel and Alternates
 - a. Requirements are specified in Subpart 1.7.
3. Section B - Job Tasks or Operations and Related Health and Safety Hazards, Levels of Protection, Air Monitoring, and Health Analysis
 - a. Requirements are specified in Subparts 1.9, 1.16, and 1.17.
4. Section C - Employee Training
 - a. Requirements are specified in Subpart 1.8.
5. Section D - Personal Protective Equipment
 - a. Requirements are specified in Subpart 1.10.
6. Section E - Medical Surveillance
 - a. Requirements are specified in Subpart 1.6.
7. Section F - Monitoring Requirements
 - a. Requirements are specified in Subpart 1.12.
8. Section G - Site Security and Control
 - a. Requirements are specified in Subpart 1.14.
9. Section H - Decontamination - Equipment and Personnel
 - a. Requirements are specified in Subpart 1.11.
10. Section I - Standard Operating Procedures, Record keeping, and Reporting
 - a. Requirements are specified in Subpart 1.15.
11. Section J - Contingency Plan
 - a. Requirements are specified in Subpart 1.13.

1.4 SUBMITTALS

- A. Four copies of the CSSP shall be submitted to the Engineer for review within seven (7) calendar days of receiving Notice to Proceed.
- B. CSSP shall be produced on double-sided, 8-1/2 x 11 paper.

1.5 INTRODUCTION (TO CSSP)

- A. The following information shall be included in the introduction to the CSSP:
 1. Date prepared.
 2. Persons preparing the CSSP.
 3. Site location.
 4. Name and telephone number of Contractor Project Manager.
 5. Name and telephone number of Contractor Site Superintendent.
 6. Name and telephone number of Contractor Health and Safety Officer.
 7. Name and telephone number of Contractor Site Safety Coordinator.
- B. The introduction to the CSSP also shall contain a brief description of the site, including a general site background, and a brief description of planned field activities.

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CONTRACTOR SITE SAFETY PLAN

- C. Identify persons with the authority to upgrade/downgrade levels of protection and to stop work.

1.6 MEDICAL SURVEILLANCE (SECTION E OF CSSP)

- A. Follow guidelines established for medical surveillance as outlined in 29 CFR 1910.120.
- B. A medical certification as to the fitness or unfitness for employment on this job, or any restrictions on his/her utilization that may be indicated, shall be provided by the Contractor's physician to the Engineer. A final medical evaluation shall be required when employment is terminated for an individual prior to completion of the Contract or at the end of the Contract.
 - 1. Supply information to the physician as required by 29 CFR 1910.120.
 - 2. Provide results of the employee's medical exam to that employee.
- C. Any employee who develops a work-related time loss illness or injury during the period of the Contract shall be evaluated by the Contractor's physician prior to allowing the employee to re-enter the work site.

1.7 KEY PERSONNEL (SECTION A OF CSSP)

- A. Provide a Health and Safety Officer who will direct the development of the CSSP, train employees, and provide overall management of the Contractor's health and safety requirements covered in the CSSP.
- B. Following employee training, under the auspices of an acceptable CSSP, a Site Safety Coordinator working under the direction of the Health and Safety Officer may be utilized for continued safety and health surveillance. The Site Safety Coordinator shall have authority to act on all health and safety measures and to establish new controls as needed. The minimum qualifications and experience of the health and safety personnel shall be as described below.
- C. The Health and Safety Officer shall be the Contractor's representative with overall responsibility for the preparation, implementation, and enforcement of the CSSP. The Health and Safety Officer shall have a minimum of three years of specialized experience in the hazardous waste or chemical industry with hazards similar to those anticipated on this project. The Health and Safety Officer shall have a broad working knowledge of state and federal occupational safety and health regulations and formal training in occupational safety and health. In addition, the Health and Safety Officer shall have demonstrable expertise in air monitoring techniques and in the development of respiratory protection programs. The name, qualifications, and work experience of the Health and Safety Officer shall be included in the CSSP.

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CONTRACTOR SITE SAFETY PLAN

- D. The Site Safety Coordinator shall be the Contractor's representative assigned for the duration of the project with functional responsibility for implementation and enforcement of the CSSP. The Site Safety Coordinator shall have a minimum of two years experience in the chemical or hazardous waste industry, a sound working knowledge of federal and state occupational safety and health regulations, formal training in occupational safety and health, and demonstrable experience in air monitoring techniques and the administration of respiratory protection programs. The Site Safety Coordinator shall also have current certification in cardiopulmonary resuscitation (CPR) and multimedia first aid. The name, qualifications, and work experience of the Site Safety Coordinator shall be included in the CSSP. The Site Safety Coordinator shall be present on site during all activities performed by the Contractor (and its subcontractors) that could present chemical (refer to Subpart 1.8A) or physical (refer to Subpart 1.16.1) hazards.
- E. All health and safety personnel shall be qualified in first aid and CPR and certified by the American Red Cross or equivalent programs.
- F. If the Contractor's operations are performed during more than one work shift per day, a Site Safety Coordinator shall be present for each shift.
- G. The Health and Safety Officer shall conduct periodic inspections as necessary to determine the overall effectiveness of the CSSP. Any deficiencies shall be submitted to the Engineer in writing and the CSSP will be modified accordingly. Should the deficiencies be of a nature to present an immediate danger, the Health and Safety Officer shall stop all work in the area and initiate changes as required immediately.

1.8 EMPLOYEE TRAINING (SECTION C OF CSSP)

- A. For work areas that involve contact with, or potential exposure to, contaminated soils, including but not limited to excavation and handling of soils, trenching, and dust generating activities, staff must have successfully completed a classroom occupational hazards training program and other training that meets or exceeds the requirements of OSHA 1910.120. Submit certification that each person to be assigned to such work has successfully completed an approved training program prior to entering the site.
- B. Training shall include at a minimum:
 - 1. Acute and chronic effects of toxic chemicals.
 - 2. Routes of exposure (skin penetration, inhalation, and ingestion) and specific operations that could result in exposure.
 - 3. Need for personal protection (effectiveness and limitations).
 - 4. Proper use and fitting of all types of respirators to be used on-site (to include drills in donning an emergency respirator).
 - 5. Establishing on-site work zones.

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CONTRACTOR SITE SAFETY PLAN

6. Engineering controls and safe work practices associated with employee's work assignment, including dust control measures and use of the buddy system.
 7. Personnel and equipment decontamination.
 8. Emergency response.
- C. At least one member of each work crew shall have training in the use of portable fire extinguishers in accordance with OSHA 1910.157G.
- D. The health and safety staff shall be responsible for training all personnel entering the site in order to make them aware of site-specific hazards and to explain emergency procedures and the use of protective gear required.
- E. Require that any person employed on the site read the CSSP. Each person entering the site shall sign a statement attesting that they have read and understood the CSSP and shall agree to follow the provisions contained therein. Include a sample form for attestment in the CSSP.
- F. Basic training shall be conducted if special problems have been observed during the previous week (i.e., in proper use of respirators, protective clothing, etc.). Special training shall be conducted if unanticipated problems occur on-site and when a change of operation occurs. The health and safety staff shall also provide initial training to replacement employees using the training outlined in the CSSP. This training shall be site- and task-specific and shall include basic training and special training.

1.9 WORK AREAS (SECTION B OF CSSP)

- A. For purposes of this project, the Support Zone, Contamination Reduction Zone, and Exclusion Zones shall be defined as follows:
1. Support Zone - Non-contaminated areas that may be used by the Contractor for office and administrative functions and parking of employee vehicles. This area is limited to the paved parking lot located at the site entrance.
 2. Contamination Reduction Zone - This zone shall be established at all areas where personnel, vehicles, and equipment enter or exit the Exclusion Zone. This zone is to be considered contaminated, therefore only OSHA-trained personnel may enter this area. This zone is limited to the existing vehicle decontamination station, decontamination trailer, the edge of paved parking lot, and any other decontamination stations established by the Contractor.
 3. Exclusion Zone - This zone encompasses all contaminated areas of the site. Only OSHA-trained personnel may enter the Exclusion Zone. Any area within the site including all areas within the perimeter fenceline which are not defined as a Support or Contamination Reduction Zone as well as areas outside the fence and along the Willamette River bank shall be considered part of the Exclusion Zone.

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- B. Any variations from the designated work areas shown on the drawings required by the Contractor after the CSSP has been submitted and approved must be reviewed by the Engineer.
- C. The Contractor shall ensure that each employee has the proper personal protective equipment for the area in which he or she is to perform work.
- D. The Contractor shall establish a Contamination Reduction Zone(s) to prevent the transfer of contaminants outside of the Exclusion Zone. It is intended to eliminate the possibility of the physical transfer of contaminating substances on people, equipment, or in the air to unregulated areas. This can be accomplished through a combination of decontamination, distance from active work areas, zone restrictions, and work function. The Contamination Reduction Zone will contain personnel and equipment decontamination facilities and emergency equipment.
- E. The Support Zone shall be located outside the Exclusion Zone. Change rooms, lunch and break areas, and support facilities (to include supplies, equipment storage, and maintenance areas) shall be located in this area. Eating, smoking, etc., shall only be allowed in this area.
- F. The Contractor shall provide safe coordination of heavy equipment and machinery movement in all work areas.
- G. The Contractor shall provide adequate traffic control as required by Section 01570. The CSSP shall describe provisions for minimizing hazards to the Contractor's equipment and to the public that include:
 - 1. Separating the public from the construction roads and work areas by means of detours, if necessary.
 - 2. Keeping to a minimum the number of points where construction equipment crosses public streets.
 - 3. Installing all signs prior to their actual need.
 - 4. Removing all signs when they are no longer needed.
 - 5. Ensuring that road grime, parked vehicles, stockpiled materials, etc., do not obscure signs.
 - 6. Inspecting all signs to ensure they are properly maintained.
 - 7. Selecting and training flagmen.
 - 8. Complying with applicable laws.
 - 9. Minimize inconvenience to local residents and the general public.

1.10 PERSONAL PROTECTION REQUIREMENTS AND METHODS (SECTION D OF CSSP)

- A. Equipment for personal protection is described herein and in publications such as the Interim Standard Operating Safety Guides (EPA - November 1984) and the Occupational Safety and Health Guidance Manual for Hazardous Waste Site

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Activities (NIOSH/OSHA/USCG/EPA, October 1985). This plan shall serve as minimal safety requirements, which shall not be reduced unless the Contractor's air monitoring or other data support a change in protection level and the Engineer is informed of the change.

- B. A description of on-site levels of protection and the personal protective equipment required for each level shall be included in the CSSP. Methods of monitoring and defining the appropriate level of protection shall be included.
- C. As a minimum, the following levels of protection shall be included:
 - 1. Level C: Including, at a minimum, a full-face air-purifying respirator with appropriate cartridge, disposable chemical-resistant coveralls, protective gloves and boots, disposable booties, and hard hat.
 - 2. Level D: Including, at a minimum, flame-resistant cotton coveralls, chemical resistant safety boots, safety glasses, and hard hat.
 - 3. Level D Modified: Level D per above, with the addition of chemical-resistant disposable coveralls.
- D. Define the appropriate level of protection to be used for each work activity at this site in the CSSP. The minimum level of protection on site in the work areas is anticipated to be Level D.
- E. Ensure that appropriate protective equipment is being used during activities in the work areas. Define in the CSSP what protective equipment must be worn. To ensure that the appropriate protective equipment is available for on-site work, include a list of protective equipment available and a description of its proper use in the CSSP. This list shall include, but may not be limited to, the following:
 - 1. *Respiratory Protection:*
 - a. All respiratory protection must follow OSHA Safety and Health Standards 29 CFR 1910.134.
 - 2. *Chemical-Resistant Clothing:* Long-sleeve, one-piece, hooded coverall garments constructed of saran-covered chemical-resistant materials impervious to the contaminants identified on site shall be used as directed by the CSSP and implemented by the Site Safety Coordinator. Where disposable garments are not used, a suitable decontamination and temporary storage system shall be developed. Once the protective apparel is donned, duct tape shall be used to secure the coverall legs to the boots, the sleeves to the gloves, and the hood to the respirator in order to prevent any openings.
 - 3. *Gloves:* A pair of chemical-resistant outer gloves and, if appropriate to the specific task, double-layered surgical gloves shall be worn as directed by the Site Safety Coordinator. Cuffs will be duct-taped to sleeves of Tyvek suits.
 - 4. *Boots:* Chemical-resistant (neoprene or equivalent), steel-toe and reinforced-shank boots at least 15 inches in height and meeting or exceeding ANSI Z41.1 shall be required.
 - 5. *Eye Protection:* Suitable eye protection, such as safety glasses and protection for workers' eyeglasses, shall be included in the CSSP.

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6. *Hearing Protection:* Suitable hearing protection, depending upon the work in progress, shall be included in the CSSP.
7. *Other Protective Equipment:* Other protective equipment available to the Contractor for on-site work shall be included in the CSSP.

1.11 PERSONNEL AND EQUIPMENT DECONTAMINATION (SECTION H OF CSSP)

- A. Define in the CSSP proper methods of personnel and equipment decontamination. Include decontamination pad layout, proper disposal of decontamination generated wastes, and facilities and equipment necessary for decontamination.
- B. All required respirators shall be provided and maintained by the Contractor and shall be cleaned daily. Provide details explaining daily maintenance in accordance with the appropriate OSHA standards (29 CFR 1910.134).
- C. All disposable clothing, gloves, expendable protective wear, used respirator cartridges, and other contaminated materials shall be placed in containers for temporary storage on site in an area designated by the Engineer. Precautionary labels shall be affixed prominently to containers of contaminated scrap, waste, debris, and clothing. Containers shall be sealed and moved only with the proper equipment, and shall be secured to prevent dropping or loss of control during transport. Transport and disposal in an approved manner shall be provided by the Contractor in accordance with RCRA and United States Department of Transportation (USDOT) regulations.

1.12 MONITORING REQUIREMENTS (SECTION F OF CSSP)

1.12.1 ON-SITE AIR MONITORING BY CONTRACTOR

- A. For purposes of health and safety of the Contractor's employees, on-site air quality monitoring shall be conducted by the Contractor at the start of each new activity to characterize the degree of exposure from each specific operation and for suspected major contaminants. Requirements for continuous or periodic monitoring shall be determined based on the knowledge of the air contaminants, and operational and physical stressors at the site. Contractor shall be responsible for continuous monitoring with a particulate dust monitor or equivalent. An air monitoring plan that dictates air-sampling frequencies, strategies, and protocols shall be submitted as part of the CSSP. It is important that the plan include real-time monitoring so that data is immediately available for site safety decisions. A description of monitoring techniques and equipment shall be included in the CSSP. Monitoring shall meet, at a minimum, the requirements of 29 CFR 1910.120.
- B. Decisions regarding worker protective measures, routine work procedures, and emergency actions shall be based on data collected during air monitoring.

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- C. Sampling shall be conducted on a regular basis, and additionally as required by special or work-related conditions, by the Contractor's health and safety personnel. All monitoring data shall be recorded in a site safety log and shall become part of the overall site record. Reports of the air monitoring results shall be transmitted to the Engineer.
- D. The Contractor shall ensure that the degree and type of respiratory protection provided for on-site employees is consistent with the monitored concentrations of airborne contaminants.

1.12.2 PERSONNEL MONITORING BY CONTRACTOR

- A. The climate, combined with the requirements for personal protective equipment, may create heat or cold stress. The Contractor shall incorporate requirements for monitoring personnel physiological parameters to prevent deleterious effects to personnel. The CSSP shall include provisions for either modifying work schedules or implementing the use of protective wear to avoid injury due to heat or cold stress. Refer to "Occupational and Health Guidance Manual for Hazardous Waste Site Activities," published October 1985 by NIOSH/OSHA/USCG/EPA.
- B. Applicable personnel (refer to Subpart 1.8A) shall be included in a medical surveillance program. Personal medical records shall be immediately accessible if necessary. Include the names of all persons who are trained and certified in CPR and First Aid. The number of individuals trained in CPR and First Aid on-site during working hours must be enough to provide timely response to any emergency requiring such aid.

1.13 EMERGENCY PROVISIONS (SECTION J OF CSSP)

- A. Develop a contingency plan for on-site and off-site emergencies that shall address, at a minimum, the following and comply with 29 CFR 1910.120:
 - 1. Pre-emergency planning.
 - 2. Personnel roles, lines of authority, training, and communication.
 - 3. Emergency recognition and prevention.
 - 4. Safe distances and places of refuge.
 - 5. Site security and control.
 - 6. Evacuation routes and procedures.
 - 7. Decontamination.
 - 8. Emergency medical treatment and first aid.
 - 9. Emergency alerting and response procedures.
 - 10. Critique of response and follow-up.
 - 11. Personal protective equipment and emergency equipment.
 - 12. Notification of emergency services.

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- B. All accidents and unusual events shall be dealt with in a manner that minimizes continued health risk of site workers and the general public. Include an Emergency Preparedness Plan in the CSSP that shall include, at a minimum, those items listed below. The plan shall be prepared in accordance with 29 CFR 1910.120.
1. First aid or other appropriate initial action shall be administered by those closest to the accident/event. This assistance shall be conducted in a manner that ensures that those rendering assistance are not placed in a situation of unacceptable risk.
 2. All accidents or unusual events shall be reported to the Site Safety Coordinator. The Site Safety Coordinator is responsible for conducting the emergency response in an efficient, rapid, and safe manner. He or she will decide if off-site assistance and medical treatment are required and arrange for any necessary assistance. In any event, the Engineer shall be notified.
 3. In the event of an emergency requiring notification of off-site personnel, the Contractor's Construction Superintendent shall be responsible for immediately notifying appropriate agencies and personnel. If for some reason he or she is not available, the Site Safety Coordinator shall perform this function. The Engineer shall be continually apprised of the situation.
 4. Immediately inform the Engineer and the STATE of any accident or unusual event involving either the general public or workers onsite.
- C. A roster of names and phone numbers of all personnel and agencies that could be involved in emergency response shall be developed by the Site Safety Coordinator and will be posted at several prominent locations at the site. The following contacts shall be included on this list:
1. Fire department.
 2. Police.
 3. Ambulance.
 4. Hospital.
 5. Poison center.
 6. Oregon Emergency Response Services (OERS) (800-452-0311).
- D. These contacts shall be informed of the operations at the start of the job. In addition, a map showing the location of the hospital will be included and the route checked. Map shall include written directions.
- E. When work is being accomplished, the following portable equipment and facilities shall be provided by the Contractor in the Contamination Reduction Zone for ready access to work locations, or immediately adjacent to active work locations when they are remote from the Contamination Reduction Zone:
1. A portable emergency shower/eyewash with a capacity for providing clean water of at least 2 gpm for a 15-minute period.
 2. One class ABC-type portable fire extinguisher with a 2A:10BC rating.

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CONTRACTOR SITE SAFETY PLAN

3. Each vehicle and item of motorized equipment used in the work zones shall be equipped with a one class ABC-type portable fire extinguisher with a 2A:10BC rating.
4. Two-way radios.
5. First-aid kit complying with 29 CFR 1926.50(d)(i).
6. Stretcher.

F. Maintain a completed OSHA Form 200 on site.

1.14 SITE SECURITY AND CONTROL (SECTION G OF CSSP)

The Contractor is wholly and totally responsible for the security of Contractor-owned, -rented, or -supplied material and equipment no matter where it is located. This section of the CSSP shall describe the following:

- A. Control measures around work areas.
- B. Security measures to be employed to protect the Contractor's equipment.

1.15 STANDARD OPERATING PROCEDURES, RECORDKEEPING, AND REPORTING (SECTION I OF CSSP)

- A. Maintain logs and reports covering implementation of the CSSP and present the format of these logs and reports in the CSSP. The formats shall be developed by the Contractor to include training logs, weekly reports, and phase-out reports. Maintain applicable Standard Operating Procedures (SOPs) on site.
- B. Training logs shall include records of both initial and refresher training and shall also include:
 1. Personnel trainee name (with attendance check and signature).
 2. Topic covered and time spent in training session.
 3. Equipment demonstrations and practice.
 4. Other, including fit testing of respirators.
 5. Date and place of training.
- C. Submit weekly reports that shall include:
 1. Summary sheet covering range of work done.
 2. Any incidents of:
 - a. Nonuse of protective devices in an area where required.
 - b. Nonuse of protective clothing.
 - c. Disregard of buddy system.
 - d. Eating and smoking in prohibited areas.
 - e. Instances of job-related injuries and illness (an accident report will also be required).
 - f. The Site Safety Coordinator's signature and date.

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- D. Develop SOPs pertinent to the activities on-site. The Contractor's existing SOPs may be utilized to the extent that they are applicable and to the extent that they are in accordance with these Specifications. SOPs shall address personal precautions and operations. All personnel affected shall be familiar with the SOPs, a copy of which shall remain on site at all times.

1.16 HEALTH AND SAFETY RISK ANALYSIS (SECTION B OF CSSP)

- A. The type of contamination at the site is reported in Section 01010 - Summary of Work and in the reports noted in Section 00890 - Previous Studies.

1.16.1 PHYSICAL HAZARDS

- A. Safe operation of heavy earthmoving equipment and supply vehicles requires that:
 - 1. Only trained and qualified individuals are permitted to operate this type of equipment.
 - 2. Maintenance programs be thorough and comply with the manufacturer's specifications.
- B. Hazards that may be encountered or caused by earthmoving equipment include, but are not limited to, the following:
 - 1. Normal traffic hazards.
 - 2. Potential for equipment roll-over.
 - 3. Potential for moving equipment to damage structures.
 - 4. Potential for equipment fires.
 - 5. Potential for trench collapse.
 - 6. Potential for moving equipment to injure employees and the general public.
- C. Excavation work shall conform to OSHA requirements as covered in 29 CFR 1926.650. Before excavation work begins, underground utilities such as electric, gas, water, and sewer mains shall be located and marked. Once the excavation work has started and a trench has been dug, the following precautions shall be taken to reduce the likelihood of injuries:
 - 1. Every trench in which employees may be exposed to cave-in and which is over 5 feet in depth or shows evidence of instability (regardless of depth), regardless of soil type (except solid rock), must be shored, braced and/or otherwise stabilized in accordance with OSHA regulations.
 - 2. Prior to an employee entering a trench or depression, the atmosphere must be checked using an O₂/explosimeter to assure that there is sufficient oxygen and no explosive atmosphere. These areas will also be surveyed using real-time organic monitoring equipment prior to entry and routinely during the work.
 - 3. Ladders shall be provided at 25-foot intervals along the trench.
 - 4. Employees shall not work in a trench alone.
 - 5. Excavations that must be left open during non-work periods must be isolated using barricades (e.g., temporary orange construction fence).

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- 6. Trenches shall be kept free of any standing water.
- 7. The Contractor shall have a competent person onsite, as defined by OSHA, for all trench work.

- D. Address any physical hazard that may expose a worker or local residents to injury. List the hazards anticipated and the specific methods for handling each potential hazard.
- E. Define specific methods to be used to prevent local residents from accessing the work zone during hours of work.
- F. Address potential noise hazards.

1.17 ACTION LEVELS (SECTION B OF CSSP)

- A. Action levels for employee protection and emergency actions shall be defined and included in the CSSP. Action levels should be based on airborne concentrations of contaminants observed during the air quality monitoring of the work site.
- B. Action levels for organic vapors shall be established by the Contractor based upon levels above background determined using an OVA or equivalent instrument.
- C. Irrespective of action levels for organics, elevated readings on the OVA that exceed 1 ppm above background at the perimeter of the site shall be cause for the Contractor to modify his operations to reduce organic vapors. Such perimeter readings shall be taken whenever elevated readings are noted at the site of the work.

PART 2 PRODUCTS

[Not Used.]

PART 3 EXECUTION

[Not Used.]

END OF SECTION

[Appendix A to be presented at the pre-construction meeting.]

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intentionally left blank.

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers requirements for workers' qualifications to ensure quality of work.

1.2 REFERENCES

[Not used.]

1.3 QUALIFICATIONS OF WORKERS

- A. For each portion of the work, provide at least one person per shift who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the referenced standards and requirements of the work, and who shall personally direct all work performed under each section.
- B. For each portion of the work, provide sufficient skilled workers who are thoroughly familiar with the type of construction, materials, and techniques specified.
- C. For any welding portion of the work, provide welders qualified for the welding procedure(s) that the welder will perform.
- D. No allowance will be made in the acceptance or rejection of any portion of the work for lack of skill on the part of the workers.
- E. Where regulatory requirements mandate that one or more workers performing a task have specialized training or certification, provide workers that possess such training or certification. This includes the OSHA requirement for "competent person" for activities such as excavation.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

[Not used.]

END OF SECTION

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SECTION 01450
CONTRACTOR QUALITY CONTROL PLAN

PART 1 GENERAL

1.1 REQUIREMENTS

- A. The Contractor shall provide a Contractor Quality Control Plan (CQCP). The CQCP shall identify personnel and procedures to be used in carrying out the requirements of this project.

1.2 CONTENTS OF THE CQCP

- A. The CQCP shall identify the personnel to implement the CQCP and the procedures to be implemented.
1. *Personnel.* The Contractor shall identify a Quality Control Inspector (QCI), member of either Contractor's staff or prime subcontractor's staff, who shall perform quality control procedures and implement the CQCP. The QCI may have other duties on site but shall be neither the Contractor's nor prime subcontractor's project manager or site superintendent. The QCI shall have the authority to communicate directly with the Contractor's home office management and shall have the authority to stop the work if critical components are not functioning as intended. The QCI shall be onsite at all times when work is actively being performed. The resume of the QCI shall be included with the CQCP and shall show either formal training in QA/QC or at least 6 months cumulative experience acting in a similar role on other project(s).
 2. *Documentation.* The QCI shall maintain a Quality Control Field Notebook documenting all inspections and observations made by the QCI. This notebook shall be available upon demand at all times to either the Engineer or the STATE.
 3. *Checklist.* As part of the CQCP, the Contractor shall develop a checklist indicating items that must be observed and the frequency of observation. Additionally all required tests shall be identified. The Contractor may propose some of these tests as part of submittals required under other sections of these Specifications. In developing the checklist, the Contractor shall list every Specification section and all specific items in each section that must be inspected.
 4. *Critical Items.* The following are considered critical items and shall be inspected as or more frequently than indicated.
 - Any item that would allow a spill of any material to enter the river (inspect during any refueling or similar activity),
 - Any item that would cause eroded or potentially eroded material to enter the river (inspect twice daily), or
 - Any condition that would create a hazard to the health of workers or the general public.
 5. *Corrective Action.* The CQCP shall identify general types of corrective measures to be taken if problems occur.

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CONTRACTOR QUALITY CONTROL PLAN

6. *Independent Laboratory.* The Contractor shall identify one or more independent laboratories or specialized inspection firms to perform specialized tests as may be required by other sections of these Specifications. Although more than one laboratory may be proposed, only one laboratory shall be proposed for any single type of test. Each laboratory proposed shall identify its credentials.

1.3 SUBMITTALS

- A. Within 21 calendar days following Notice to Proceed, the Contractor shall provide the Engineer with the completed CQCP for review and acceptance. If this date falls on a weekend or holiday, the submittal date shall be the next non-holiday or non-weekend day. The CQCP shall be part of the Construction Operations Plan (COP).
- B. Revisions, as required.
- C. Record of Corrective Actions taken, ongoing.
- D. Field inspection notebooks, at end of Project.

1.4 NOTIFICATION OF CHANGE

- A. Following acceptance of the CQCP, the Contractor shall propose revisions to the CQCP at any time that the procedures or processes differ from those stated in the previously approved CQCP. Additionally, if the CQCP fails to consistently identify ongoing problems, the Contractor shall propose revisions to rectify the situation. These proposed revisions must be submitted to the Engineer, with adequate time for approval by the STATE, prior to the change being instituted.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

Implement the Quality Control Program in accordance with the approved CQCP.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. This section describes the existing security measures at the site and presents the security requirements to be employed by the Contractor during completion of this Contract.
- B. Irrespective of any limitations to responsibility for site security specified hereafter, the Contractor is wholly and totally responsible for the security of Contractor-owned, -rented, or -supplied material and equipment no matter where it is located.

1.2 RELATED SECTIONS

- A. Section 01320: Construction Operations Plan
- B. Section 01330: Contractor Site Safety Plan
- C. Section 01570: Traffic Control and Safety

1.3 REFERENCES

[Not Used.]

1.4 SITE CONTROLS

- A. The site shall be divided into the following work zones, as defined in Section 01330:
 - 1. Support Zone(s): Non-contaminated areas that may be used by the Contractor for office and administrative functions and parking of employee vehicles. This area is limited to the paved parking lot located at the site entrance.
 - 2. Contamination Reduction Zone(s): This zone shall be established at all areas where personnel, vehicles, and equipment enter or exit the Exclusion Zone. All visible dirt and dust must be completely removed from personnel, vehicles, and equipment in this zone. This zone is to be considered contaminated. Therefore only OSHA-trained personnel can enter this area, and appropriate health and safety measures must be utilized. This area is limited to the existing vehicle decontamination station, decontamination trailer, the edge of paved parking lot, and any other decontamination stations established by the Contractor.
 - 3. Exclusion Zone: This zone encompasses all contaminated areas of the site. Only OSHA-trained personnel may enter the Exclusion Zone. Any area within the site including all areas within the perimeter fenceline that are not defined as a Support or Contamination Reduction Zone as well as areas outside the fence and along the Willamette River bank shall be considered

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SITE SECURITY AND CONTROLS

part of the Exclusion Zone. Appropriate health and safety measures must be utilized in the Exclusion Zone.

1.5 EXISTING SECURITY CONDITIONS

- A. The site is completely enclosed with chain-link fencing. Access to the site is restricted through lockable gates located at the site entrance and at several locations along the fence perimeter.
- B. The existing site trailers (designated for use by the STATE and the Engineer) are equipped with security alarm systems.

1.6 CATEGORIES OF AUTHORIZED PERSONNEL

- A. Only personnel described below shall have access to the site:
 - 1. Full-time employees of the Contractor assigned to the site and designated employees of the Contractor's subcontractors who are working on-site for an extended period.
 - 2. Designated employees of the STATE and the Engineer.
 - 3. Suppliers and the Contractor's subcontractors who have business on-site, but only for sporadic or short durations.

1.7 SUBMITTALS

[Not used.]

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

3.1 GENERAL

- A. Contractor shall augment the existing security measures to protect their equipment.
- B. Contractor shall provide his own lock for the site entrance gate, to be linked with the existing lock.
- C. Contractor shall restrict access to the site in such a manner that only personnel identified in Part 1.6 be allowed into the site.
- D. With the concurrence of the Engineer, inform local police and fire departments of security measures implemented. Update police and fire departments as security measures change.

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SITE SECURITY AND CONTROLS

- E. Contractor shall provide and conspicuously post signs warning of the presence of hazardous substances and the potential of hazardous work activities at the site, as appropriate.
- F. Contractor shall provide outdoor lighting at field offices and other site areas, as appropriate.
- G. Smoking shall not be allowed on site. [Not consistent with CSSP section.]
- H. All work zones shall be under the Contractor's care from start of mobilization to completion of all work on-site, including demobilization.
- I. All work zones shall be organized in a manner such that access can be controlled by the Contractor.
- J. Contractor shall maintain a site log of all personnel entering and exiting the site.
- K. The Engineer will be responsible for escorting persons associated with or invited by the STATE. The Contractor shall be responsible for escorting all other persons.
- L. All Contractor personnel and visitors to the site shall be briefed on site work zone boundaries, relevant site security procedures, and required levels of health and safety protection for the zones.
- M. The requirements herein are waived for personnel responding to an emergency. However, as much detail as possible shall be recorded in the security log book(s).

3.2 PUBLIC ROADS

- A. Comply with Section 01570.
- B. Unless permitted both by local ordinance and the Engineer, remove all Contractor equipment from public roads except when actively engaged in construction activities.
- C. Prohibit unauthorized personnel from entering an active work area.
- D. Do not unreasonably (as determined by the Engineer) block access to property beyond a work area.

3.3 QUALIFICATIONS OF SECURITY PERSONNEL

- A. The STATE does not require nor desire that any security personnel, if used by Contractor, be armed. However, if the Contractor feels that armed security

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SITE SECURITY AND CONTROLS

personnel are necessary, the Contractor shall submit documentation that each individual who is armed is complying with the laws of the State of Oregon.

END OF SECTION

SECTION 01550

EQUIPMENT AND MATERIAL DECONTAMINATION

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers the decontamination of all construction equipment and materials at the contamination reduction zones during the Work.
- B. Equipment decontamination shall be in compliance with Section 01330 and Section 01560.

1.2 RELATED SECTIONS

- A. Section 01320: Construction Operations Plan
- B. Section 01330: Contractor Site Safety Plan
- C. Section 01560: Protection of the Environment
- D. Section 02280: Stockpiling

1.3 REFERENCES

[Not used.]

1.4 DEFINITIONS

- A. Exclusion Zone: See Section 01330.
- B. Contamination Reduction Zone: See Section 01330.

1.5 SUBMITTALS

- A. Submit provisions for equipment decontamination, as described below, as an element of the Construction Operations Plan (Section 01320).

PART 2 PRODUCTS

2.1 EQUIPMENT

- A. Contractor shall use a pressure washer capable of producing a minimum temperature of 180 degrees Fahrenheit and a minimum pressure of 2,500 psi to decontaminate heavy equipment.
- B. The Contractor may use and maintain the existing decontamination pad during construction activities or design and/or construct its own. The existing decontamination pad is 10 feet long by 12 feet wide by 10 inches high and is

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EQUIPMENT AND MATERIAL DECONTAMINATION

designed to support up to 60,000 pounds. Modification of the existing pad shall not be permitted, however the pad may be relocated, as necessary. The STATE and Engineer shall not be held responsible for any expenses resulting from any failure of the existing pad.

- C. The existing water supply (spigot located near the existing decontamination pad) shall be made available to the Contractor for decontamination purposes.
- D. If the Contractor constructs its own decontamination pad or needs additional pads, the structure will be of sufficient strength to support the anticipated vehicle or equipment loads.
- E. The decontamination pad shall be equipped with an adequately sized sump area to collect and contain all decontamination material removed from the equipment.
- F. The Contractor shall provide all other pumps, tanks, sumps, cleaning tools, and equipment, and other supplies and materials, required to effectively decontaminate equipment.

PART 3 EXECUTION

3.1 EQUIPMENT DECONTAMINATION

- A. Before being removed from the site, all debris, equipment, and vehicles involved in excavation or in contact with soils within the Exclusion Zone as well as personal property in contact with contaminated soils shall be cleaned first by brushing off gross contamination; then, shall be cleaned with a pressurized steam cleaner or water jet until all visible traces of soil are removed. All debris, equipment, and vehicles exiting the Exclusion Zone shall be inspected by the Engineer prior to leaving the site.
- B. Heavy equipment operators shall remain in the cab when in the exclusion zone to prevent contamination of cab areas. If this is not feasible, cab floor areas shall be washed at the decontamination facilities.
- C. Personnel manning the decontamination work pad shall comply with all applicable provisions of the Contractor's Site Safety Plan.
- D. Hand tools and other hand carried items that have come into contact with soils within the Exclusion Zone shall be washed at the decontamination work pad or washed at supplemental equipment decontamination stations with detergent and water, and then rinsed with tap water.
- E. The surface of the decontamination pad shall be pressure washed periodically.

SECTION 01550

EQUIPMENT AND MATERIAL DECONTAMINATION

3.2 PERSONNEL DECONTAMINATION

- A. Contractor shall install personnel decontamination stations at all exit points from the Exclusion Zone. These stations shall be equipped with boot washes and brushes and/or pressurized water to clean workers' boots prior to entering the Support Zone. All personnel protective equipment (PPE) that has come in contact with contaminated site soils and/or groundwater also shall be removed at these decontamination stations and deposited in proper refuse containers.
- B. Use of the existing decontamination trailer by the Contractor shall not be allowed. This facility is designated for use by the STATE and the Engineer.

3.3 WASTE COLLECTION AND DISPOSAL

- A. All decontamination wastewater shall be allowed to infiltrate into site soils by discharging onto the ground surface in contained areas within the Exclusion Zone. Discharge to the Willamette River and off-site areas is prohibited.
- B. Soil collected from the decontamination stations and all other waste soils shall be deposited on-site at appropriate stockpile areas.
- C. All PPE to be disposed of that has come in contact with contaminated site soils and/or groundwater shall be brushed clean of all loose soil, rendered unusable, double bagged and placed in a container(s) for temporary storage on site. Dispose of materials at an appropriate off-site disposal facility.
- D. All other materials to be disposed that have come in contact with contaminated site soils and/or groundwater shall be double bagged and placed in a container(s) for temporary storage on site in an area designated by the Engineer. Precautionary labels shall be affixed prominently to containers of contaminated scrap, waste, debris, and clothing, as necessary. Containers shall be sealed and moved only with proper equipment, and shall be secured to prevent dropping or loss of control during transport. Dispose of materials at an appropriate off-site disposal facility.
- E. The Contractor shall obtain all necessary permits and approvals from the disposal facility(ies) and/or governing agencies prior to hauling any waste off site. Transport and dispose of materials in accordance with applicable federal, state, and local regulations.

END OF SECTION

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SECTION 01560
PROTECTION OF THE ENVIRONMENT

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers the means and methods the Contractor shall employ in protecting the environment in and around the project site during construction.
- B. The Contractor shall strictly adhere to the measures specified herein, and take additional measures, as may be required by federal, state, and local regulations, to minimize any adverse impacts to the environment during the performance of work.
- C. The Contractor's activities shall be limited to the boundaries of the work areas and public rights-of-way.
- D. The requirements herein are in addition to requirements in other sections of the Specifications.

1.2 RELATED SECTIONS

- A. Section 01320: Construction Operations Plan
- B. Section 02100: Mobilization and Site Preparation
- C. Section 02280: Stockpiling

1.3 REFERENCES

- A. "Guidelines for Erosion and Sedimentation Control Planning and Implementation", EPA-72-015.
- B. "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters" EPA-840-B-93-001
- C. "Processes, Procedure, and Methods to Control Pollution Resulting from All Construction Activity," EPA 43019-73-007.
- D. "NPDES Stormwater Regulations for Construction Projects," Oregon Department of Environmental Quality, February 2001.

1.4 SUBMITTALS

- A. Submit provisions for erosion control and sediment control, as described below, as an element of the Construction Operations Plan (COP; Section 01320). The NPDES General Permit for Construction requires preparation of a Storm Water Pollution Prevention Plan (SWPPP) and a Spill Prevention and Control Plan (SPCC). These shall be included in the COP.

SECTION 01560
PROTECTION OF THE ENVIRONMENT

1.5 PERMITS

- A. NPDES General Permit for Surface Water Discharge.
- B. NPDES General Permit for Construction

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Provide storage tanks, sump pumps and hoses, temporary berms, drainage ditches, polyethylene sheeting and sandbags, silt fencing, sediment retention measures, and other materials and equipment necessary to control surface water and sediment during construction of the Work.
- B. Provide suitable products to construct the erosion and sediment controls. Contractor shall submit proposed erosion and sediment control material specifications to the Engineer for approval, prior to construction of the control.
- C. Provide sorbant booms, pads, and other sorbant materials and vacuum pumps to remove and isolate any sheen or product seep resulting from construction activities.

PART 3 EXECUTION

3.1 PROTECTION OF WATER QUALITY

- A. It is imperative that watercourses do not become contaminated or further contaminated, as applicable, with sediment or other contaminants.
- B. The Contractor shall refer to "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters" EPA-840-B-93-001 for examples of management practices to minimize the effects of sheet pile installation on or near the ordinary high water (OHW) mark.
- C. The Contractor shall be fully responsible for any and all damages to life, property, and animal life that occur as a result of his negligence. During piling removal, extraordinary care shall be taken to prevent soil or debris from being deposited on the beach. Damages resulting from negligence of the Contractor which result in polluting watercourses shall be repaired, restored, or compensated for by the Contractor.
- D. All construction materials and equipment shall be removed from the shoreline in the event of river flooding or high water conditions that may occur during the construction period.

SECTION 01560
PROTECTION OF THE ENVIRONMENT

- E. The Contractor shall observe rules and regulations of the State of Oregon and agencies of the U.S. government prohibiting pollution of any stream, river, or wetland by dumping of refuse, wastewater, rubbish, or debris therein
- F. Provide temporary rainwater runoff diversion around work areas as needed to prevent cross contamination of work areas and off-site releases. All rainwater is to remain on site and be allowed to infiltrate into the soil. Runoff to the Willamette River and off-site areas is prohibited.
- G. Comply with procedures outlined in EPA manuals entitled, "Guidelines for Erosion and Sedimentation Control Planning and Implementation," EPA-72-015, and "Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity," EPA 43019-73-007.
- H. Existing debris along the river shore is also considered essential to the river environment. This includes transient items such as grounded floating timber. The material shall be moved carefully and returned to its original location. The Contractor and the Engineer shall come to a reasonable agreement on items that must be temporarily moved.
- I. Any equipment used on the beach shall be checked for oil leaks and other potential environmental hazards on a daily basis. No equipment posing environmental hazards shall be operated on the beach. All equipment shall be removed from the beach each day.
- J. The SPCC plan shall include the following:
 - All refueling shall be performed at a designated area at least 100 feet from the river.
 - The refueling area shall have measures in place to collect drips beneath nozzles.
 - Fuel storage tanks shall have double containment.
 - Spill control materials shall be readily available both at the refueling area and adjacent to the site of active work.

3.2 PROTECTION OF AIR QUALITY

- A. Air Quality Objectives are:
 - 1. Compliance with state and federal ambient air quality standards for all parameters throughout the community surrounding the work areas as applicable.
 - 2. Use of all practical methods for the suppression of fugitive dust as normal practice.
- B. Minimize potential for air pollution by wetting down bare and disturbed soils; minimizing free fall of soil and eliminating excessive drop heights during material

SECTION 01560
PROTECTION OF THE ENVIRONMENT

transfer; covering soil stockpiles; limiting the size of open excavations or the duration an excavation is open in areas where odor generating contamination is found; controlling vehicle speeds and designating traffic patterns; properly operating combustion emission control devices on all construction vehicles and equipment; and shutting down motorized equipment when not in use.

- C. Refuse burning will not be permitted.
- D. If temporary heating devices are necessary for protection of work, such devices shall be of type that will not cause air pollution.
- E. Additional requirements are detailed in other sections of these Specifications.

3.3 VEGETATION PROTECTION

- A. Removal of vegetation shall be restricted to those areas necessary to regrade the bank and install greenway habitat, as approved by the Engineer. See Section 02100 for clearing and grubbing requirements.
- B. The Contractor shall limit removal of large trees to the maximum extent practicable.
- C. Vegetation not designated or approved for removal shall be left in place and protected from damage or injury during construction. The Contractor shall provide full and adequate protection against construction damage to all vegetation that is to remain.

3.4 USE OF CHEMICALS

- A. Chemicals used, whether herbicide, pesticide, disinfectant, polymer, reactant, or other classification, must be approved by either the EPA, USDA, or any other applicable regulatory agency and be used in a manner recommended by the manufacturer.
- B. Use of such chemicals and disposal of residues shall be in conformance with manufacturers' instructions.
- C. Use of chemicals must be approved in advance by the Engineer.

3.5 NOISE CONTROL

- A. Conduct operations to minimize the potential for annoyance to residents in vicinity of work, and comply with applicable local ordinances.
- B. Equip compressors and other apparatus with such mechanical devices as may be necessary to minimize noise and dust. Equip compressors with silencers on intake lines.

SECTION 01560
PROTECTION OF THE ENVIRONMENT

- C. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.
- D. Comply with federal, state, and local noise regulations as applicable.

3.6 EROSION CONTROL MEASURES

A. Temporary Measures

- 1. The Contractor shall provide temporary control measures as hereinafter specified to control, minimize, and prevent soil erosion and water pollution that could be brought about by the effects of his construction operations and/or procedures upon the existing terrain. The requirements of this section shall apply to all water flowing over the work areas.
- 2. The temporary pollution control provisions contained herein shall be coordinated with the permanent work to be performed under this Contract to the extent practical, to assure economical, effective, and continuous erosion control throughout the construction and post construction period.
- 3. Temporary pollution control measures shall be provided for work performed outside the limits of the work areas, when such work is necessary (e.g., haul roads).

B. Temporary Sediment Control

- 1. The Contractor shall provide temporary erosion and sediment control measures to control and/or prevent soils and sediment from traveling outside of work areas. Measures may include, but are not limited to, silt fences, berms, and straw bales. The requirements of this section shall apply to all activities.
- 2. The Contractor shall install silt fences, as needed, to prevent the migration of silt to the river or shoreline.

C. Construction Requirements

- 1. It shall be the responsibility of the Contractor to investigate and to comply with all applicable federal, state, and local laws and regulations concerning pollution of waterways. In the event of conflict between the requirements of these Specifications and pollution control laws, rules, or regulations of the federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.
- 2. Temporary pollution control measures shall be used to correct conditions that develop during construction, and shall also be implemented if they are needed prior to completion of the permanent work or are needed temporarily to control erosion that develops during normal construction activities.
- 3. The Contractor shall cover all soil stockpiles, contaminated and backfill, with appropriate material so as to prevent wind and water erosion. See Section 02280 for stockpiling requirements.

SECTION 01560
PROTECTION OF THE ENVIRONMENT

3.7 CONSTRUCTION EQUIPMENT

- A. The Contractor shall decontaminate all equipment used at other sites prior to delivery to the site.
- B. The Contractor's equipment that is left on site shall be maintained in such a manner as to prevent leaks and spills of oil, gasoline, lubricants, and other materials used for maintenance work.
- C. The Contractor shall be responsible for cleanup and proper disposal of any materials spilled onto a work area, or surrounding areas.

3.8 MANAGEMENT OF DEBRIS AND WASTE MATERIALS

- A. The Contractor shall be responsible for preventing off-site movement of all waste materials, spills, etc., resulting from construction processes, and shall be responsible for any consequences of any such off-site movement of the material.
- B. All debris and waste material leaving the site shall be disposed of at a permitted sanitary landfill (RCRA subtitle D) or a subtitle "C" facility, as appropriate.
- C. Plant growth above-ground that is cut will be considered as uncontaminated.
- D. Any debris and waste that is buried will be considered as contaminated.
- E. Comply with all federal, state and local laws and regulations concerning waste movement, transport, and disposal.

3.9 ARCHAEOLOGICAL AND CULTURAL RESOURCES

- A. If cultural resources are discovered during any construction activities, the Contractor shall notify the Engineer immediately and all activities that may damage said cultural resources shall be temporarily suspended. The Contractor shall resume work in the area of concern upon notification by the Engineer or STATE.
- B. Cultural resources of Native American origin covered by this paragraph include but are not limited to:
 - 1. any human skeletal remains or burials;
 - 2. artifacts;
 - 3. shell;
 - 4. midden;
 - 5. bone;
 - 6. charcoal or other deposits;
 - 7. rock alignments;
 - 8. pavings, wall, or other constructed features; or
 - 9. any indication of agricultural or human activities (except woodtreating).

SECTION 01560
PROTECTION OF THE ENVIRONMENT

END OF SECTION

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intentionally left blank.

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers minimum requirements for traffic regulation and control during the course of the project.

1.2 REFERENCES

- A. United States Department of Transportation, *Manual on Uniform Traffic Control Devices*, Millennium Edition, December 2000, referenced hereafter as MUTCD.
- B. City of Portland, State of Oregon, and Multnomah County ordinances and regulations, as applicable.

1.3 INTERFERENCE WITH TRAFFIC

- A. The following describes the roadways where anticipated impacts on existing traffic could result from the Contractor's operations and at which the Contractor shall implement measures described in this section:
 - 1. North Edgewater Street
 - 2. North Willamette Boulevard
- B. North Edgewater Street typically is utilized by Engineer personnel, Metro personnel, Burlington Northern Santa Fe Railroad personnel, and Union Pacific Railroad personnel. Access to North Edgewater Street is restricted near the intersection with N. Willamette Boulevard by a lockable steel gate. During working hours, the gate is to be closed but not locked. At the completion of the daily activities, the gate shall be chained/clasped (not locked) by the Contractor.
- C. Contractor is required to provide traffic control at the intersection of N. Edgewater St. and N. Willamette Blvd. when trucks are entering or exiting the site.

1.4 INTENT

- A. The Contractor shall keep roadways safely passable at all times.
- B. The Contractor shall make every effort to maintain excellent safety conditions for his workers, the general public (drivers, passengers, and pedestrians), and all vehicles.
- C. The Contractor shall minimize the inconvenience to the general public.
- D. Emergency vehicles and trains shall be given the right-of-way in all situations.

1.5 CONFLICTS

- A. Should the requirements herein be in conflict with current or future federal, state, or local laws and regulations, the conflict shall be brought to the attention of the Engineer. The more stringent requirement shall govern.

1.6 REGISTRATION

- A. All vehicles and equipment operating on public streets shall be licensed in accordance with local, state, and federal laws.

PART 2 PRODUCTS

- A. The Contractor shall provide signs and other traffic control devices in accordance with the standards established in the latest edition of MUTCD.

PART 3 EXECUTION

3.1 GENERAL

- A. The Contractor shall provide, at his expense, adequate safety devices necessary to prevent and avoid hazardous conditions created by the Contractor's operations.
- B. During any construction, barriers, warning signs, and other traffic control devices shall be erected, lighted, and maintained, as necessary, for the protection of the traveling public.
- C. The Contractor shall be liable for injuries and damages to persons or property suffered by reason of the Contractor's operations or any negligence in connection therewith.
- D. During working hours, all vehicles and/or non-operating equipment that are parked for a long period of time (2 hours or more) shall be parked at the support area or at the edge of the exclusion zone, as appropriate.
- E. Flaggers, if used, shall possess a current flagging card issued by the State of Oregon.
- F. Workers engaged in flagging or traffic control shall wear reflective vests and hard hats.
- G. MUTCD standard Stop/Slow paddles (18 inches wide, letters 6 inches high, and reflectorized) shall be used for flagging operations.
- H. Coordination should be made between adjacent or overlapping projects to check that duplicate signing is not used and to check compatibility of traffic control between adjacent or overlapping projects.

SECTION 01570
TRAFFIC CONTROL AND SAFETY

END OF SECTION

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intentionally left blank.

SECTION 01580

EXISTING UTILITIES AND SUBSURFACE FEATURES

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers requirements for identification and work in the vicinity of utilities and other subsurface features including, but not limited to, telecommunications, telephone, gas, all petroleum products, steam, water, electric power, cable television or video programming, telegraph, sanitary sewer, storm sewer, monitoring wells, structure foundations, bridge footings, utility vaults, utility poles, drainage, irrigation, and similar pipes, lines, or cables.

1.2 RELATED SECTIONS

- A. Section 02140: Surveying
- B. Section 02200: Earthwork
- C. Section 02220: Adsorbent Cap Material
- D. Section 02270: Upland Treatment
- E. Section 02610: Well Abandonment
- F. Section 02620: Well Installation or Modification
- G. Section 02630: Fencing

1.3 IDENTIFICATION

- A. Approximate locations of buried utilities and subsurface features, as well as overhead power lines within the site are presented on the Drawings. However, the Contractor shall assume other buried utilities and subsurface features could exist.
- B. The location of subsurface features and utilities outside the property line are not known.
- C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AVOIDANCE AND PROTECTION OF ALL UTILITIES AND OTHER SUBSURFACE FEATURES, AND IS ADVISED TO FIELD VERIFY ALL UTILITY LOCATIONS.
- D. Numerous monitoring wells exist at the site as indicated on the Drawings. The Contractor shall field locate and protect all wells during the site activities, unless otherwise noted. Where wells are located within the area of work and whose damage cannot otherwise be avoided (as determined by the Engineer), said wells shall be properly abandoned in accordance with Section 02610.

SECTION 01580

EXISTING UTILITIES AND SUBSURFACE FEATURES

- E. As noted on the Drawings, a natural gas main and gas service piping to the site exist near the site's northern property line. A network of water piping also exists throughout the site, as shown on the Drawings. The Contractor shall locate and protect the utility lines as specified herein.
- F. Two high-pressure sewer lines run parallel to the BNSF railway on the north end of the site and angle within the river channel, as shown on the Drawings. The Contractor shall protect the sewer lines.

1.4 SUBMITTALS

- A. The Contractor shall submit as part of the Construction Operations Plan (Section 01320) explicit methods and procedures that shall be used for identification and protection of all on-site utilities and subsurface features.

PART 2 PRODUCTS

[Not Used.]

PART 3 EXECUTION

- A. It shall be the responsibility of the Contractor to accurately field locate and prevent damage to all utilities and subsurface features. If any utility or subsurface features are damaged, they shall be repaired or replaced at the Contractor's expense.
- B. It shall be the responsibility of the Contractor to meet all utility crossing requirements and conditions, as may be required by federal, state, and local regulations as well as the public or private entity providing the utility.
- C. Existing monitoring wells requiring abandonment shall be abandoned prior to the bank regrade and cap construction. See Section 02610 for requirements.
- D. The Contractor shall notify all utility providers well in advance of performing work near utilities (in particular, the high pressure sewer lines), as it is anticipated that representatives from utility providers may request to be present during the work.
- E. The Contractor shall not excavate using heavy equipment (backhoes, bulldozers, jackhammers, etc.) within two feet in either direction of known utility lines. Excavation at these locations shall be completed using hand tools.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers requirements for construction aids.
- B. All construction aids must be in accordance with current OSHA and State of Oregon standards.

1.2 RELATED SECTIONS

- A. Section 01320: Construction Operations Plan
- B. Section 01330: Contractor Site Safety Plan
- C. Section 01550: Equipment and Material Decontamination

1.3 REFERENCES

[Not used]

1.4 SUBMITTALS

- A. All foreseen construction aids and descriptions of their use at the site shall be included in the Construction Operations Plan (Section 01320).

1.5 DEFINITIONS

- A. Construction aids are temporary devices or supports necessary or convenient for completion of the work described herein.

1.6 DESIGN AND USE

- A. The Contractor is responsible for the design, construction, use, and removal of all construction aids, as necessary.
- B. For construction aids not specifically noted herein, use best standard practice for the design and construction.
- C. Should the Engineer detect any perceived unsafe condition during the course of this Contract, the Engineer will report same to the Contractor's shift superintendent, who shall immediately investigate the situation and remedy it if the superintendent deems it necessary.

1.7 DECONTAMINATION AND DISPOSAL

- A. It shall be the Contractor's responsibility to either decontaminate or otherwise properly dispose of all construction aids that have been contaminated during construction. See Section 01550 for decontamination procedures.

1.8 FIELD LAVATORY

- A. The Contractor shall be responsible for procurement, installation, maintenance, and removal of portable field lavatories for the duration of the fieldwork.
- B. Lavatories shall be located sufficiently far from the riverbank so that potential for spills to reach the riverbank is eliminated.

1.9 FIELD TRAILER

- A. The Contractor shall be responsible for mobilization and temporary installation of a field trailer for use as a field office. The trailer shall be maintained and operated by the Contractor. (Note, the existing field trailers located within the paved entrance area are designated for use by the STATE and the Engineer.)
- B. The field trailer shall be installed within the Support Zone (paved entrance area) at a location approved by the Engineer.
- C. The Contractor shall provide connections for temporary utility services as specified.
- D. The Contractor shall remove the field trailer, contents, and temporary utilities after completion of all construction work; remove foundations and debris; and restore the area to its original or better condition.
- E. One of the Contractor's trailers shall have sufficient room, a sufficiently large table, and an adequate number of chairs, such that the weekly construction meeting (10 persons) could be held therein. The weekly construction meeting shall be held there. Other than the weekly meetings, the area shall be for the Contractor's use.

1.10 TEMPORARY UTILITIES

- A. The Contractor shall bear all expenses for placing, relocating, and removing all utilities until this Contract is complete.
- B. The Contractor shall install temporary electrical power to Contractor's field office, as necessary. Existing electrical service junction is located near the southeast corner of the paved entrance area. The main site electrical meter and power panels are located in the shop building. Single phase, 120/240 volt and three phase, 480 volt power is available.

**SECTION 01610
CONSTRUCTION AIDS**

- C. All temporary electrical connections shall be in accordance with OSHA and the National Electric Code.
- D. Telephone service to the site does not exist (service has been destroyed). Contractor shall be confined to cellular services only. The Engineer is attempting to have the service restored, but there is no guarantee that this will occur.
- E. The Contractor may use the existing site water services. Water line locations are shown on the Drawings. Water taps are available in the existing decontamination trailer, the former shop building, the decontamination pad, and outside the decontamination trailer. Modification of existing lines shall not be allowed without approval by the Engineer and the City of Portland Bureau of Water Works.
- F. All work shall be performed in accordance with utility company requirements.
- G. The STATE shall be responsible for payment of electrical and water service utilities.

1.11 LADDERS, SCAFFOLDING, AND STAGING

- A. Provide ladders, scaffolding, and/or staging as necessary to accomplish the work.
- B. Scaffolding may be of suspension type, or of standing type such as metal tube or coupler, tubular welded frame, pole or outrigger, or cantilever. The type, erection, and use of all scaffolding (including railings and toeboard use) shall comply with all applicable standards and provisions set forth by the Office of Safety and Health Administration (OSHA).
- C. Erect and move scaffolding in a manner precluding damage to anything.

1.12 SHORING, SHEETING, COFFERDAMS, TRENCH BOXES, AND BRACING

- A. Contractor shall provide shoring, sheeting, cofferdams, trench boxes, bracing, and/or other measures to provide stable excavation slopes and protect onsite personnel according to OSHA requirements whenever:
 - 1. The depth of excavation exceeds 5 feet;
 - 2. Soil and groundwater conditions create unstable conditions; or
 - 3. Potential traffic or construction equipment loadings could create unstable conditions.
- B. Contractor shall provide shoring, sheeting, bracing, and/or other measures to protect existing property, utilities, pavement, etc.
- C. A competent and experienced supervisor representing the Contractor that is thoroughly familiar with the shoring equipment, installation, and type of work to

**SECTION 01610
CONSTRUCTION AIDS**

be performed, must be in direct charge and control of the shoring operation at all times. In all cases, the supervisor must be continually present at the job site during all shoring operations.

- D. Contractor shall remain responsible for satisfactory results.
- E. Refer to Section 01330, Contractor Site Safety Plan, for other safety requirements.

1.13 TEMPORARY FENCING

- A. Temporary construction fencing shall be used by the Contractor to barricade all open excavations or to restrict access to staging areas or areas where construction activities are underway.
- B. Post spacing, setting, and fabric attachment shall be appropriate to provide a sturdy and durable temporary construction fence.
- C. Fence material shall have a high visibility coating. Minimum height of fence shall be 4 feet.
- D. The fence shall be maintained as necessary until completion of activities requiring the fencing.

1.14 CONSTRUCTION LIGHTING (IF ELECTED)

- A. Portable construction lights may be used to allow construction activities during non-daylight hours. Minimum illumination intensities specified in 29 CFR 1926.56 shall be required. Construction activities outside the lighted areas shall not be permitted.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

[Not used.]

END OF SECTION

SECTION 01630
STORAGE AND PROTECTION

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers the storage requirements for materials, equipment, and supplies that are to be used during the course of this project.

1.2 RELATED SECTIONS

- A. Section 01320: Construction Operations Plan

1.3 REFERENCES

[Not used.]

1.4 SUBMITTALS

- A. Proposed location and layout of storage areas shall be included in the Construction Operations Plan (Section 01320).

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

3.1 GENERAL

- A. Store products, immediately on delivery, in accordance with manufacturer's instructions, with seals and labels intact. Protect until installed.
- B. Arrange storage in a manner to provide access for maintenance of stored items and for inspection.
- C. Store products that are subject to damage by the elements in substantial weather tight enclosures.
- D. Provide substantial platforms, blocking, or skids, to support fabricated products above ground; slope to provide drainage. Protect products from soiling and staining.
- E. For products subject to discoloration or deterioration from exposure to the elements, cover with impervious sheet material. Provide ventilation to avoid condensation.
- F. Contractor shall take full responsibility for the safety and security of materials and equipment mobilized or delivered to the site.

SECTION 01630
STORAGE AND PROTECTION

END OF SECTION

SECTION 01700
CONTRACT DOCUMENTATION AND CLOSEOUT

PART 1 GENERAL

1.1 REQUIREMENTS

- A. The Contractor shall deliver the following items before the final payment is made:
1. The originals of all logbooks used on the job, unless otherwise waived by the STATE.
 2. A letter from the Contractor that all work has been performed in accordance with this Contract and is complete in every respect.
 3. A letter from the Contractor that all wages and debts incurred by the Contractor because of this Contract have been paid in full. This letter shall be notarized.
 4. A letter from the bonding company stating that they have reviewed the Contractor's final request for payment and agree that payment thereof will not release the bonding company from any of its obligations under the bond.
 5. A letter from the Contractor stating that final payment will be a release of the Contractor from any and all claims the Contractor might have against the STATE or Engineer because of this Contract.
 6. Final paperwork required under the Davis-Bacon Act.
 7. Work completion records, certificates, record drawings, and all other required submittals per Section 01300.
- B. All letters shall be signed by an officer or principal of the Contractor, except the letter from the bonding company that shall be signed by a responsible party, with power-of-attorney attached.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

[Not used.]

END OF SECTION

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PART 1 GENERAL

1.1 SUMMARY

- A. Items included in this section cover the responsibilities of the Contractor for site maintenance during this project.

1.2 RELATED SECTIONS

- A. Section 01320: Construction Operations Plan
- B. Section 01550: Equipment and Material Decontamination
- C. Section 01560: Protection of the Environment
- D. Section 01630: Storage and Protection
- E. Section 02900: Demobilization

1.3 STORAGE OF MATERIALS

- A. All materials, as specified herein, shall be stored and transported in appropriate containers.
- B. Store and protect products for the duration of the project under provisions of Section 01630.

1.4 SUBMITTALS

- A. All methods and procedures to be used for site maintenance shall be included in the Construction Operations Plan (Section 01320).

PART 2 PRODUCTS

[Not Used.]

PART 3 EXECUTION

3.1 DURING CONSTRUCTION

- A. The Contractor shall clean all work site areas and adjacent properties on a daily basis to keep them clean from debris, rubbish, discarded equipment, and refuse materials resulting from work activities.
- B. The Contractor shall provide containers for the collection of all waste materials, debris, rubbish, and refuse. These materials shall be periodically disposed, as necessary, at a licensed, offsite disposal facility.

**SECTION 01800
SITE MAINTENANCE**

- C. All vehicles, equipment, facilities, and construction aids shall be maintained in good working condition for the intended use.
- D. The Contractor shall maintain all permanent and temporary fences in a condition satisfactory to the Engineer.
- E. The Contractor shall perform and maintain dust control and environmental protection at all times as described in Section 01560.
- F. All roads, parking and lay-down areas, and access to the site and work areas shall be maintained and kept in condition for its intended use, including periodic cleaning or re-grading, as necessary.
- G. The decontamination pad(s) shall be cleaned on a periodic basis to prevent the accumulation of residues. All decontamination wastewater and sediment in the wastewater shall be handled in accordance with Section 01550.
- H. The site is currently surrounded by chain-link fence. The Contractor may remove sections of fencing as necessary to facilitate its operations. Temporary barriers shall be erected during periods of non-activity to provide safe conditions. Any fence sections removed shall be replaced in kind. The existing fence may be salvaged to the extent that it is in satisfactory condition.

3.2 FINAL CLEANING

- A. The site, adjacent properties, material sites, staging areas, and all other ground the Contractor occupied to perform the work shall be left neat and presentable.
- B. Prior to completion of the work, the Contractor shall conduct an inspection of the entire site and certify to the Engineer that the entire site is clear of all waste materials, rubbish, surplus materials, temporary structures, equipment, and debris.

END OF SECTION

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DIVISION 2

DIVISION 2
SITE WORK

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SECTION 02100
MOBILIZATION AND SITE PREPARATION

PART 1 GENERAL

1.1 SUMMARY

- A. Furnish and mobilize all equipment and materials required to prepare the site and complete all work as specified herein.

1.2 RELATED SECTIONS

- A. Section 01320: Construction Operations Plan
- B. Section 01330: Contractor Site Safety Plan
- C. Section 01610: Construction Aids
- D. Section 01560: Protection of the Environment
- E. Section 01580: Existing Utilities and Subsurface Features
- F. Section 02200: Earthwork
- G. Section 02220: Sediment Cap Material

1.3 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.
- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) a detailed site layout plan indicating the locations of all work areas, parking areas, health and safety zones, decontamination stations, storage areas, staging areas, loading/unloading areas, field office, etc.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

3.1 INSTALLATION

- A. All facilities, equipment, and materials shall be mobilized to the site following approval of the Construction Operations Plan (Section 01320) and review of the Contractor Site Safety Plan (Section 01330), as specified in these Contract documents.

SECTION 02100
MOBILIZATION AND SITE PREPARATION

- B. The Contractor shall install the field office structure and make all temporary utility connections as specified in Section 01610.
- C. The Contractor shall establish and construct stockpile, staging, loading, unloading, decontamination, storage, and/or other work areas, as necessary, as specified herein, or at locations directed by the Engineer.

3.2 CLEARING

- A. Vegetation and debris shall be cleared from the designated work areas where needed and as approved by the Engineer. The Contractor shall be responsible for obtaining all applicable permits.
- B. Clearing shall consist of removing all unwanted material from the work surface including, but not limited to, trees, brush, downed timber and rotted wood, rubbish, and other obstructions interfering with the work when removal of such surface obstructions are approved by the Engineer;
- C. Protect from damage, as directed by the engineer, trees, bushes, shrubs, or other existing improvements which are to remain. There are restrictions on removing any materials from the shoreline. See Section 01560.
 - 1. Salvage large woody debris on the shoreline for replacement upon project completion.
- D. Removal of vegetation shall be carefully restricted to only those areas necessary to facilitate re-grading the bank and installation of the sediment cap and greenway vegetation, as approved by the Engineer.
- E. Removal of large trees shall only be with the approval of the Engineer as required to perform the work.
- F. Existing fencing sections may be temporarily removed as approved by the engineer where fencing interferes with the Work. The engineer must approve the temporary fence that will be placed across removed sections during overnight or non-work hours. See Section 01610 for temporary fencing requirements. Relocate and restore fencing to its pre-construction condition at the completion of Work.
- G. Refuse resulting from clearing operations shall be stockpiled within the upland area at a location(s) approved by the Engineer. Vegetative debris above ground level will be segregated and stockpiled for appropriate offsite disposal by the Contractor. Non-vegetative materials and/or subsurface materials resulting from clearing operations shall remain on site. The refuse material shall not be pushed or moved onto adjacent properties, the Willamette River, or be buried on the project site. No burning shall be allowed.

SECTION 02100
MOBILIZATION AND SITE PREPARATION

- H. Existing shoreline characteristics shall be maintained to the maximum extent practicable during construction. The means and the frequency by which heavy equipment accesses the beach areas shall be limited and must be approved by the Engineer. See Section 01560.

3.3 GRUBBING

- A. Grubbing shall consist of removing all unwanted vegetative matter from below the surface including, but not limited to, stumps, roots, buried logs and timber, etc.; and removing drains, culverts, foundations, footings, and such other obstructions that interfere with the Work where needed and as approved by the Engineer.
- B. Disposal requirements for grubbing shall be the same as those described above for clearing.

3.4 PROTECTION

- A. Protect existing features to remain as part of final site features.
- B. Protect from all damage groundwater monitoring wells, unless otherwise noted, above- and below-ground utilities, structures, trees, vegetation, fences, and paving which are to remain after project completion. See Section 01580 for utility and subsurface feature protection requirements.
- C. All surface and subsurface utilities and features, including overhead utilities, which are to remain shall be protected from damage. If damaged, they shall be repaired or replaced at the Contractor's expense.

END OF SECTION

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intentionally left blank.

PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies the technical requirements for the removal of the pilings, dolphins, and submerged portions of the former creosote dock located throughout the proposed sediment cap footprint. The locations of the pilings, dolphins, and the former creosote dock to be removed are shown on the Drawings.
- B. All creosoted material, pile stubs and associated sediments, and used absorbent material shall be disposed of by the Contractor in a landfill which meets the requirements for solid waste landfills specified under Oregon Administrative Rules (OAR) Division 340-94.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Construction Operations Plan
- C. Section 01330: Contractor Site Safety Plan
- D. Section 01560: Protection of Environment
- E. Section 01630: Storage and Protection
- F. Section 02100: Mobilization and Site Preparation

1.3 REFERENCES

- A. OAR Division 340-94.

1.4 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.
- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) a detailed description of the nature of the work to be performed, the proposed approach and sequence, type of equipment to be used, locations of cranes and barges, debris control, disposal of materials, temporary construction aids, any unavoidable impacts, compliance with all environmental permit provisions, construction phasing, and necessary safeguards/precautions and mitigating measures.

**SECTION 02120
PILING REMOVAL**

- C. Contractor shall submit as part of the Environmental Monitoring Plan (Section 01330) a plan for monitoring water quality during removal of dolphins and pilings. The monitoring equipment, monitoring frequency, and action levels to be utilized during piling removal shall be specified in the water quality monitoring plan.
- D. The Contractor shall provide receipts of disposal from the disposal facility to the Engineer within thirty (30) days of the removal and disposal activities. The receipt shall show the measured net weight of material disposed. Upon completion of removal and disposal activities, the Contractor shall certify to the Engineer, in writing, that all creosoted materials were disposed of at an authorized disposal facility.

PART 2 PRODUCTS

[Not Used.]

PART 3 EXECUTION

3.1 PILING REMOVAL

- A. Pilings, dolphins, and remnants of the creosote dock shall be removed from the areas designated on the Drawings. Removal of pilings, dolphins, and debris shall commence prior to placement of the sediment cap material.
- B. Pilings, dolphins, and submerged creosote dock remnants shall be removed by sawing, snipping, or other approved means. The pilings shall be removed at the mud line, not below.
- C. The Contractor shall not use a vibratory extractor remove pilings.
- D. The Contractor shall minimize sediment disturbance during removal of pilings, dolphins, and submerged creosote dock remnants.
- E. The Contractor shall employ appropriate means of controlling migration of oil, oily debris, or other floating debris that may be released during piling removal. At a minimum the following control methods should be employed:
 - 1. Containment Boom: An oil containment boom shall be employed during all piling removal activities. The boom shall encircle the areas where pilings are being removed as well as the barge. This boom shall also serve to collect any floating debris. Oil absorbent materials shall be employed if visible product is observed. The booms shall remain in place until all oily material and floating debris has been collected and the sheens have dissipated.
 - 2. Absorbent Pads: The Contractor shall maintain a supply of oil absorbent pads on the barge to be employed if visible contamination, beyond routine sheens as determined by the Engineer, is observed.

**SECTION 02120
PILING REMOVAL**

- 3. Debris Netting: Debris netting shall be available to collect and remove floating material or debris during all demolition and removal activities.
- F. Pilings, broken stubs, and associated sediments (if any) shall be contained on a barge (if used during piling removal). If a barge is not used during the removal of pilings, removed pilings, broken stubs, and associated sediments shall be contained in a designated upland storage area. The perimeter of the barge or the upland storage area shall be encircled by of a row of hay or straw bales, or filter fabric, to allow for dewatering of the sediments and run-off from piles. The arrangement of the containment area shall meet the approval of the Engineer.
- G. Excess waste materials shall not be cast upon the adjacent waters or beaches.
- H. Contractor shall make all work areas safe. Contractor shall cease work in an area until all unsafe conditions have been made safe. See Section 01330.

3.2 DISPOSAL OF PILINGS, DOLPHINS, AND SUBMERGED CREOSOTE DOCK REMNANTS

- A. Recovered pilings, dolphins and submerged creosote dock remnants shall be transported off site for reuse (if possible) or for disposal at an appropriate landfill.
- B. All creosoted material, pile stubs and associated sediments, and used absorbent material shall be disposed of by the Contractor in a landfill which meets the requirements for solid waste landfills specified under OAR Division 340-94.

3.3 WATER QUALITY MONITORING

- A. The Contractor shall be responsible for preventing, to the extent practicable, the off-site movement of all waste materials, spills, etc., resulting from the removal process, and shall be responsible for any consequences of any such off-site movement of the material.
- B. The Contractor shall monitor water quality down gradient of the work zone to determine the impacts of the Work. At a minimum, total suspended solids (TSS) and dissolved oxygen (DO) should be monitored. If the TSS one-hundred feet down gradient of the work area is 10% greater than background and/or if the DO drops below 5 milligrams per liter, then removal activities shall be suspended until conditions improve.

END OF SECTION

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PART 1 GENERAL

1.1 SUMMARY

- A. The Contractor shall perform all surveys to the extent specified herein to layout features, determine required elevations, lines and grades, and to document at the completion of work.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Construction Operations Plan
- C. Section 02100: Mobilization and Site Preparation
- D. Section 02145: Bathymetric Surveying
- E. Section 02200: Earthwork
- F. Section 02270: Upland Treatment
- G. Section 02280: Stockpiling
- H. Section 02400: Articulated Concrete Block
- I. Section 02610: Well Abandonment
- J. Section 02620: Well Installation or Modification
- K. Section 02630: Fencing

1.3 REFERENCES

- A. Oregon Administrative Rules (OAR), Chapter 820, Division 20: *Rules of Professional Conduct*, December 2002
- B. OAR, Chapter 820 Division 30, *The Practice of Land Surveying*, December 2002
- C. Oregon Revised Statutes, Chapter 672, *Professional Engineers; Land Surveyors; Geologists*, 2001

1.4 EXISTING SURVEYS

- A. Existing site features and shore/upland topography shown on the Drawings are based on a survey performed by David Evans and Associates, Inc., of Portland, Oregon, in November 2001.
- B. Two bathymetric surveys of the Willamette River were completed by David Evans and Associates, Inc., and Minister-Glaeser Surveying, Inc., in October 1999 and October 2000, respectively, as shown on the Drawings.
- C. Basis of bearing and coordinates for surveys: North American Datum of 1983 (NAD83); Oregon State Plane Coordinate System (SPCS), Oregon North Zone (international feet).
- D. Vertical datum for upland survey: National Geodetic Vertical Datum (NGVD) 1929/47 as established from NGS benchmark No. E718.
- E. Vertical datum for bathymetric surveys: Columbia River Datum (CRD). - To convert CRD elevations to NGVD 1929/47, add 1.74 feet.
- F. Three benchmarks (3-1/2" brass cap in concrete) exist on site as shown on the Drawings. Said benchmarks may be used for survey control.
- G. Electronic copies of the survey files in AutoCAD ".dwg" format shall be made available on compact disk (CD) by the Engineer, upon request by the Contractor. The data on the CD is believed to be accurate but is not guaranteed. The CD does not replace the Contract Drawings.

1.5 PERSONNEL QUALIFICATIONS

- A. All work shall be under the responsible charge of a Professional Surveyor with a current and valid license in the State of Oregon.
- B. All surveying work shall be performed by personnel experienced in the work to be performed.

1.6 PROTECTION OF PROPERTIES

- A. The surveyor shall avoid damaging property. The surveyor shall be responsible for repairing all damage to public and private property caused by his operations.
- B. The surveyor may clear brush or vegetation, where needed, to perform work and as approved by the Engineer. See Section 02100 for clearing requirements.

1.7 ACCURACY

- A. Surveys shall be accurate to complete the Work to the lines, grades, and tolerances specified herein and as shown on the Drawings. The final survey shall document the as-built Work as specified in this section and related sections.
- B. Traverse surveys shall be completed to Federal Geodetic Control Subcommittee (FGCS) Third Order, Class One Standards and have an unadjusted closure of 1 in 10,000 after azimuth adjustment. Unadjusted azimuth closure shall not exceed 3.0 seconds per station.
- C. Vertical control surveys shall have an unadjusted closure of 0.017 feet multiplied by the square root of the control traverse distance in miles. This is consistent with FGCS First Order requirements.
- D. All traverses and control surveys shall be adjusted.
- E. Horizontal Accuracy: All points for construction layout and record surveys shall be horizontally accurate to the nearest 0.05 foot relative positioning from established control points.
- F. Vertical Accuracy: All points for construction layout and record surveys shall be accurate to within 0.01 feet vertically for both construction layout and record surveys.

1.8 REFERENCE DATUMS

- A. The basis of coordinates, basis of bearings, and vertical datums indicated above and as shown on the Drawings shall be used for all survey work performed.

1.9 DOCUMENTATION

- A. All data obtained during a survey shall be permanently recorded. A field notebook shall be maintained noting location, survey-crew members, dates, times, weather, field sketches, and other pertinent data (e.g., computer calculations or coordinates used to verify survey accuracy, closure notes, etc.).
- B. Data recorded electronically shall be preserved on computer media (CD-ROM). A hard copy of all electronically obtained data shall be maintained.

1.10 LAYOUT SURVEYING AND STAKING

- A. All work performed shall be in conformance with the lines, grades, slopes, cross sections, profiles, and dimensions as shown on the Drawings and in a manner consistent with accepted practices.

- B. The Contractor shall lay out work from the established control points, benchmarks, and baselines indicated on the Drawings and make all related measurements. Contractor shall furnish all stakes, templates, platforms, equipment, tools, materials, and labor as may be required in laying out the Work from the established control points, benchmarks, and baselines.
- C. The Contractor shall not deviate from the approved Drawings, unless approved in writing by the Engineer.
- D. All construction staking shall be inspected by the Engineer prior to construction.
- E. The minimum staking of the upland treatment shall be as follows:
 - 1. Stake at a minimum every 50 feet along bank regrade indicating required cuts or fills to achieve finish elevations as shown on drawings, and at all other locations requested by the Engineer. Record coordinates and ground surface elevations at each layout point.
 - 2. Stake greenway limits as shown on Drawings.
 - 3. Stake railroad right of way, property lines, and utility easements within the Work area.
 - 4. Install offset stakes, as necessary.

1.11 RECORD DRAWINGS

- A. Record drawings shall conform to the practice within the industry, in general, and more specifically, as specified herein.
- B. During the progress of the Work, maintain at the site a current detailed copy of survey drawings including record of all changes and data from the layouts and lines and grades, details, or other information shown on the contract drawings. Also enter the same information on the contract drawings maintained by the Contractor on the record drawings promptly, but no later than on a daily basis, using red, erasable pencil. Have on file current working record drawings showing all changes, associated construction dates, and documentation of the Engineer's approval for changes.
- C. Have on file record drawings of both interim and completed construction showing the location and elevation of all major items of Work and all finish grades. Interim construction refers to temporary surfaces that will not exist at completed construction. At a minimum, the record drawings shall include the following:
 - 1. Contours of bank regrade, extent of greenway, extent of TRM, transition area from ACB armoring to TRM, and at all other locations requested by the Engineer.
 - 2. Location, elevation, and dimension information for all utilities and any other subsurface or surface features crossed, protected, installed, relocated, repaired, or replaced.

3. Locations, dimensions, and descriptions of waste material stockpiles remaining on the site upon completion of site work.
4. Location, elevation, and description of all newly installed monitoring wells. Location and elevation shall be measured from the top of casing.
5. Location and description of newly installed fencing.
6. Locations, dimensions, and description of trees, plants and shrubbery after revegetation of bank.

1.12 SUBMITTALS

- A. Submit the following items as part of the Construction Operations Plan (Section 01320):
 1. A copy of the State of Oregon Professional Surveyor current license and experience record.
 2. Experience record(s) of instrument operator(s) who will be used to perform the surveying work.
 3. A description of the survey equipment and survey and staking method to be used to perform the survey work.
- B. Submit a copy of the field notebook, reduced survey notes, and calculations within 15 working days after the work has been performed. During construction, the field notebook and all survey notes shall be made available at the Engineer's request.
- C. Submit record drawings within 20 working days after completion of the work for review and approval by the Engineer. Record drawings documenting all survey items to be executed as specified herein shall be provided to the Engineer in both hard and electronic formats.
- D. Electronic files shall be compatible with AutoCAD Release 14 or higher and in ".dwg" format. Within AutoCAD, entities and points shall be contained in layers pertinent to the objects being surveyed. The Contractor shall submit a list of all new layers added to the drawing with layer names and descriptions for each layer and any other associated external references (xref) and/or third party files that support the drawing.
- E. The AutoCAD file shall have a separate layer for a border and title block. At a minimum, title blocks shall contain the following: name of the Contractor; name of the surveying firm that performed the survey and prepared the drawing; the title of the project; the date of preparation; and the subject matter illustrated. Border and title shall be created in paper space. All other features shall be created in model space.
- F. A "Notes" layer shall be included. The notes layer shall identify the dates of the survey, control points and benchmarks used, and any other information that the surveyor deems pertinent.

**SECTION 02140
SURVEYING**

- G. The AutoCAD ".dwg" file shall be submitted on CD-ROM.
- H. An ASCII text file containing a listing of all points including description, northing, easting, and elevation shall be submitted on CD-ROM.
- I. Hard copies of the record drawings shall be color-plotted on 24"x 36" sheets (D-size) using "matchline" techniques (as necessary) at a scale approved by the Engineer. Bar scales, north arrow, color-coded legend, and title blocks shall be shown on all drawings.
- J. Each drawing submitted shall bear the Contractor's attestation that the material presented in the drawing is true, accurate, and in conformance with the Drawings and Specifications. If contrary to the Drawings and Specifications, Contractor shall include a statement detailing the discrepancies.
- K. Four (4) copies of the initial (draft) set of record drawings shall be submitted to the Engineer. After review and comment by the Engineer, seven (7) copies of the final set of record drawings shall be submitted. Of the final sets submitted, two (2) sets shall bear the original seal and signature of the professional surveyor.

PART 2 PRODUCTS

[Not used]

PART 3 EXECUTION

- A. Perform work as required by paragraph GENERAL.
- B. Perform work in conformance with OAR 820 and ORS 672.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. The Contractor shall perform all bathymetric surveys to the extent specified herein to layout features, determine required elevations, lines and grades, and to document the completion of the Work.
- B. The Contractor shall perform bathymetric surveys immediately prior to placement of the cap, periodically during placement of cap, filter, and armoring materials, and at the completion of the work.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Construction Operations Plan
- C. Section 02100: Mobilization and Site Preparation
- D. Section 02140: Surveying
- E. Section 02210: Sediment Cap Material
- F. Section 02220: Adsorbent Cap Material
- G. Section 02230: Armor Stone
- H. Section 02400: Articulated Concrete Block

1.3 REFERENCES

- A. United States Army Corps of Engineers, *Engineering and Design: Hydrographic Surveying*, Engineering Manual (EM) 1110-2-1003, January 1, 2002.
- B. National Oceanic and Atmospheric Administration, Office of Coast Survey, *National Ocean Service Hydrographic Surveys Specifications and Deliverables*, June 2002.
- C. Oregon Administrative Rules (OAR), Chapter 820, Division 20: *Rules of Professional Conduct*, December 2002
- D. OAR, Chapter 820 Division 30, *The Practice of Land Surveying*, December 2002
- E. Oregon Revised Statutes, Chapter 672, *Professional Engineers; Land Surveyors; Geologists*, 2001

1.4 EXISTING SURVEYS

- A. Two bathymetric surveys of the Willamette River were completed by David Evans and Associates, Inc., and Minister-Glaeser Surveying, Inc. in October 1999 and October 2000, respectively, as shown on the Drawings.
- B. Basis of bearing and coordinates for existing surveys: North American Datum of 1983 (NAD83); Oregon State Plane Coordinate System (SPCS), Oregon North Zone (international feet).
- C. Vertical datum for bathymetric surveys: Columbia River Datum (CRD). To convert CRD elevations to NGVD 1929/47, add 1.74 feet.
- D. Three benchmarks (3-1/2" brass cap in concrete) exist on site as shown on the Drawings. Said benchmarks may be used for survey control.
- E. Electronic copies of the survey files in AutoCAD ".dwg" format shall be made available on compact disk (CD) by the Engineer, upon request by the Contractor. The data on the CD is believed to be accurate but is not guaranteed. The CD does not replace the Contract Drawings.

1.5 PERSONNEL QUALIFICATIONS

- A. All work shall be under the responsible charge of a Professional Surveyor with a current and valid license in the State of Oregon.
- B. All surveying work shall be performed by personnel experienced in the work to be performed.

1.6 PROTECTION OF PROPERTIES

- A. The surveyor shall avoid damaging property. The surveyor shall be responsible for repairing all damage to public and private property caused by his operations.

1.7 ACCURACY, QUALITY CONTROL, QUALITY ASSURANCE

- A. Surveys shall be accurate to complete the Work to the lines, grades, and tolerances specified herein and as shown on the Drawings. The final survey shall document the as-built Work as specified in this section and related sections.
- B. Horizontal Position Accuracy: All points for construction layout and record surveys shall be horizontally accurate, at the 95 percent confidence level, to the nearest 16 feet + 5 percent of the depth.

SECTION 02145
BATHYMETRIC SURVEY

- C. Contractors using Differential Global Positioning System (DGPS) as their primary positioning system shall adhere to the following specifications:
 - 1. GPS receiver(s) aboard the vessel will be configured such that satellites below 8E above the horizon will not be used in position computation.
 - 2. The age of pseudo-range correctors used in position computation will not exceed 20 seconds; however, any horizontal positioning interpolation must not exceed the horizontal position accuracy requirement.
 - 3. Horizontal Dilution of Precision (HDOP) will be monitored and recorded, and should not exceed 2.5 nominally. Satellite geometry alone is not a sufficient statistic for determining horizontal positioning accuracy. Other variables, including satellite pseudo-range residuals, are used in conjunction with HDOP to estimated DGPS horizontal accuracy.
 - 4. A minimum of four satellites will be used to compute all positions.
 - 5. Horizontal and vertical offsets between the GPS antenna and transducer(s) will be observed and applied in no coarser than 0.1 m increments.
- D. Vertical Accuracy: Depending on the system used to determine depth, all points for construction layout and record surveys shall be vertically accurate, at the 95 percent confidence level, as follows:
 - 1. Mechanical systems used for depths less than 15 feet: ± 0.5 feet.
 - 2. Acoustic systems used for depths less than 15 feet: ± 1.0 feet.
 - 3. Acoustic systems for depths ranging between 15 feet and 40 feet: ± 2.0 feet.
 - 4. Acoustic systems for depths greater than 40 feet: ± 2.0 feet.
- E. Minimum survey coverage density is not to exceed 500 feet.
- F. The Contractor shall minimize errors in depth readings caused by the presence of small rock fragments, unconsolidated material, and suspended sediments by implementing the measures described in EM 1110-2-1003 for obtaining acceptable depth data in these conditions.
- G. The Contractor shall implement Quality Control (QC) procedures prescribed for all survey instrumentation and data collection techniques used for this project in order to minimize systematic and random errors in individual data points. The Contractor shall follow QC procedures recommended by the equipment manufacturer's operating manuals. Additional QC information is contained in EM 1110-2-1003.
- H. The Contractor shall perform Quality Assurance (QA) tests to verify that the survey data meets the specified accuracy standards. If QA tests indicate that data does not meet the accuracy standards, additional or more stringent QC procedures may be necessary.
- I. Additional QA/QC requirements are as follows:
 - 1. Sound velocity QC calibration: 1 per day.
 - 2. Position calibration QC check: 1 per project.

3. Maximum allowable bias: ± 0.5 feet.

1.8 REFERENCE DATUMS

- A. The basis of coordinates, basis of bearings, and vertical datums indicated in Paragraph 1.4 and as shown on the Drawings shall be used for all survey work performed.

1.9 DOCUMENTATION

- A. All data obtained during a survey shall be permanently recorded. A field notebook shall be maintained noting location, survey-crew members, dates, times, weather, field sketches, water conditions, and other pertinent data (e.g. calibration results, summaries of all survey lines run and any unusual conditions encountered on these lines, and descriptions of all point features that were positioned during data acquisition).
- B. Data recorded electronically shall be preserved on computer media (CD-ROM). A hard copy of all electronically obtained data shall be maintained.

1.10 LAYOUT SURVEYING AND STAKING

- A. All work performed shall be in conformance with the lines, grades, slopes, cross sections, profiles, and dimensions as shown on the Drawings and in a manner consistent with accepted practices.
- B. The Contractor shall lay out work from the established control points, benchmarks, and baselines indicated on the Drawings and make all related measurements. Contractor shall furnish all stakes, templates, platforms, equipment, tools, materials, and labor as may be required in laying out the Work from the established control points, benchmarks, and baselines.
- C. The Contractor shall not deviate from the approved Drawings, unless approved in writing by the Engineer.
- D. All construction staking shall be inspected by the Engineer prior to construction.

1.11 RECORD DRAWINGS

- A. Record drawings shall conform to the practice within the industry, in general, and more specifically, as specified herein.
- B. During the progress of the Work, maintain at the site a current detailed copy of survey drawings including record of all changes and data from the layouts and lines and grades, details, or other information shown on the contract drawings. Also enter the same information on the contract drawings maintained by the

Contractor on the record drawings promptly, but no later than on a daily basis, using red, erasable pencil. Have on file current working record drawings showing all changes, associated construction dates, and documentation of the Engineer's approval for changes.

- C. Have on file record drawings of both interim and completed construction showing the location and elevation of all major items of Work and all finish grades. Interim construction refers to temporary surfaces that will not exist at completed construction. At a minimum, the record drawings shall include the following:
 - 1. Contours of the river bottom, extent of the sediment cap material, extent of the adsorbent cap material, extent of articulated concrete block and armorstone, and the extent of excavation of the Willamette Cove NAPL seep.
 - 2. Location, elevation, and dimension information for all utilities and any other subsurface or surface features crossed, protected, installed, relocated, repaired, or replaced.

1.12 SUBMITTALS

- A. Submit the following items as part of the Construction Operations Plan (Section 01320):
 - 1. A copy of the State of Oregon Professional Surveyor current license and experience record.
 - 2. Experience record(s) of instrument operator(s) who will be used to perform the surveying work.
 - 3. A description of the survey equipment and survey and staking method to be used to perform the survey work.
- B. Submit a copy of the field notebook, reduced survey notes, and calculations within 21 calendar days after the work has been performed. During construction, the field notebook and all survey notes shall be made available at the Engineer's request.
- C. Submit record drawings within 21 calendar days after completion of the work for review and approval by the Engineer. Record drawings documenting all survey items to be executed as specified herein shall be provided to the Engineer in both hard and electronic formats.
- D. Electronic files shall be compatible with AutoCAD Release 14 or higher and in ".dwg" format. Within AutoCAD, entities and points shall be contained in layers pertinent to the objects being surveyed. The Contractor shall submit a list of all new layers added to the drawing with layer names and descriptions for each layer and any other associated external references (xref) and/or third party files that support the drawing.

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BATHYMETRIC SURVEY**

- E. The AutoCAD file shall have a separate layer for a border and title block. At a minimum, title blocks shall contain the following: name of the Contractor; name of the surveying firm that performed the survey and prepared the drawing; the title of the project; the date of preparation; and the subject matter illustrated. Border and title shall be created in paper space. All other features shall be created in model space.
- F. A "Notes" layer shall be included. The notes layer shall identify the dates of the survey, control points and benchmarks used, and any other information that the surveyor deems pertinent.
- G. The AutoCAD ".dwg" file shall be submitted on CD-ROM.
- H. An ASCII text file containing a listing of all points including description, northing, easting, and elevation shall be submitted on CD-ROM.
- I. Hard copies of the record drawings shall be color-plotted on 24"x 36" sheets (D-size) using "matchline" techniques (as necessary) at a scale approved by the Engineer. Bar scales, north arrow, color-coded legend, and title blocks shall be shown on all drawings.
- J. Each drawing submitted shall bear the Contractor's attestation that the material presented in the drawing is true, accurate, and in conformance with the Drawings and Specifications. If contrary to the Drawings and Specifications, Contractor shall include a statement detailing the discrepancies.
- K. Four (4) copies of the initial (draft) set of record drawings shall be submitted to the Engineer. After review and comment by the Engineer, seven (7) copies of the final set of record drawings shall be submitted. Of the final sets submitted, two (2) sets shall bear the original seal and signature of the professional surveyor.

PART 2 PRODUCTS

[Not used]

PART 3 EXECUTION

- A. Perform work as required by paragraph GENERAL.
- B. Perform work in conformance with OAR 820 and ORS 672.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies requirements for excavation, trenching, grading, backfilling, and compaction of soil and other work incidental to general earthwork shown on the Drawings or required to accomplish the Work. Earthwork shall proceed consistent with the alignments, grades, and cross sections shown or indicated on the Drawings, detailed in the specifications, or required to complete other Work as shown, described, or otherwise required under this Contract.
- B. Refer to Sections 02220 and 02270 for additional excavation, backfilling, and compaction associated with organoclay placement and the upland work.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Contractor Operations Plan
- C. Section 01330: Contractor Site Safety Plan
- D. Section 01560: Protection of Environment
- E. Section 01580: Existing Utilities and Subsurface Features
- F. Section 02100: Mobilization and Site Preparation
- G. Section 02140: Surveying
- H. Section 02220: Adsorbent Cap Material
- I. Section 02270: Upland Treatment
- J. Section 02280: Stockpiling

1.3 REFERENCES

- A. State of Oregon Department of Transportation (ODOT) 2002 Standard Specifications
- B. AASHTO T27: Sieve Analysis of Fine and Coarse Aggregates
- C. ASTM D422: Standard Test Method for Particle-Size Analysis of Soils

- D. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Modified Effort.
- E. ASTM DD2922 Standard Test Methods for Soil Density and Soil –Aggregate in Place Density by Nuclear Methods

1.4 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.
- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) a detailed description of the proposed methods and means and construction sequencing to be used to perform the Work. The plan shall include, but not be limited to, details of the Contractor's plan and equipment to be used to accomplish the following work activities: 1) material and equipment storage and haul routes; 2) excavation and trenching procedures with a list of equipment proposed to complete the Work; 3) excavation shoring; 4) stockpiling; 5) placement and compaction of fill and excavation backfill; and 6) control of drainage, spills, wastes, etc.
- C. Samples and test results of imported materials intended for use in backfilling, source information including a contact name, address, phone number for each product and/or source, and qualifications of the testing laboratory, shall be submitted to the Engineer for approval seven (7) calendar days prior to beginning any excavation activities.
- D. The Contractor shall submit the qualifications of the testing laboratory to the Engineer for approval seven (7) calendar days prior to beginning any excavation activities.

1.5 QUALITY ASSURANCE

- A. The Contractor shall collect split samples or perform additional testing at the Engineer's discretion for each imported fill product.
- B. Sampling and testing for compliance shall be as follows:
 - 1. Material Testing: Sieve analysis for acceptance of aggregate gradation shall be performed using ASTM D422 unless otherwise specified
 - 2. Material Sample: The samples of the material selected for testing shall be made by the Contractor's testing laboratory and approved by the Engineer.
 - a. One sample of each designated aggregate type from each proposed source shall be tested. The samples shall be representative of the material to be imported.

PART 2 PRODUCTS

2.1 GENERAL

- A. Materials shall be of the quality, size, shape, gradation, or equal to that specified herein.
- B. Contractor may, at its option, utilize imported material with different gradation and quality characteristics than specified herein if such material is suitable for its intended use, satisfies the general requirements and intent of this Contract, and is acceptable to the Engineer.

2.2 BASE AGGREGATE

- A. Base aggregate to be used for construction of the working platforms and containment berms shall be an imported, clean, granular fill material free of roots, organic material, contaminants, rocks larger than 1 inch, and all other deleterious and objectionable material. The material shall be crushed, partially crushed, or naturally occurring granular material, shall have such characteristics of size and shape that it will readily compact, and shall conform to the following gradation when tested in accordance with ASTM D422 or AASHTO T27 (ODOT Standard Specification for 1" - 0 Base Aggregate, Section 02630):

<u>Sieve Size</u>	<u>Passing by Dry Weight (%)</u>
1 1/2"	100
1"	90-100
1/2"	55-75
1/4"	40-55
No. 10	*

*Of the fraction passing the 1/4" sieve, 40% to 60% shall pass the No. 10 sieve.

- B. The material shall also meet the following test requirement:
 - 1. Sand equivalent: 30 minimum.
- C. After segments of the S-B wall are constructed and prior to protective cap installation, base aggregate previously used for construction of working platforms and containment berms may be reused for construction of the protective cap, as approved by the Engineer.

PART 3 EXECUTION

3.1 GENERAL

- A. Prior to excavation activities, the Contractor shall clear and grub the excavation area per Section 02100.

**SECTION 02200
EARTHWORK**

- B. The Contractor shall protect utilities and subsurface features during excavation in accordance with Section 01580.
- C. Excavation, backfill, compaction and grading shall be removed or placed within the tolerances established or within reasonably close conformity with the alignment grade and cross-sections indicated on the drawings, described in the specifications, or as established or directed by the Engineer.
- D. Contractor shall inform and satisfy himself as to the character, quantity, and distribution of all material to be excavated. Should Contractor excavate below the designated lines and grades without being directed by the Engineer to do so, the excavation shall be backfilled with appropriate material at the Contractor's expense.
- E. Excavation of every description, classification, and of whatever substances encountered within the limits of the project shall be performed to the lines and grades necessary, as indicated on the Drawings. Temporary drains and drainage ditches shall be installed to intercept or direct surface water which may affect the promotion or condition of the work in accordance with the requirements of Section 01560, 3.1. Grade excavations to prevent run-on of surface water.
- F. The Contractor shall identify and verify with the plans, the required lines, levels, contours, and datum locations. Any discrepancies shall be immediately reported to the Engineer. See Section 02140 for surveying requirements.
- G. Excavation material shall be moved with the use of mechanical or hand operated equipment, such as shovels, loaders, backhoes, clamshells, bulldozers, excavators, graders, scrapers, trenchers, rippers, etc., but shall not require drilling and blasting or drilling and line breaking. Excavation by sluicing method will not be permitted unless specifically approved by Engineer.
- H. Excavated material shall not be placed adjacent to the excavation until sideslopes and excavation support systems have been designed, constructed and maintained for anticipated loads. Material stored adjacent to the excavation, shall be supported back from the edge of the excavation as required by OSHA.
- I. Excavation shall be done in dry weather when possible. Contractor shall grade top perimeter of excavation to prevent surface water from entering the excavation. Contractor shall assume all responsibility for removal, handling, treatment, and disposal of any surface water that enters the excavation in accordance with appropriate local, state, and federal regulations. Contractor shall also be required to remove and replace any aggregate materials rendered unstable as a result of such run-on of surface water.
- J. Contractor shall provide a method(s) to control dust around the excavations in accordance with the requirements of Section 01560.

- K. Contractor shall excavate materials from stockpiles in a systematic manner. See Section 02280 for stockpiling requirements.
- L. Excavated materials that are visibly contaminated, as determined by the Engineer, shall be segregated and separately stockpiled on-site in accordance with Section 02280.
- M. Contractor shall make safe all work areas. Contractor shall cease work in an area until all unsafe conditions have been made safe. See Section 01330.
- N. Contractor shall provide safe access to the excavation for all work and any inspections that may be required during excavation activities.
- O. Keep placement surfaces free of water, debris, organic matter and foreign material during placement and compaction of fill and backfill materials. No fill shall be placed on frozen surfaces.

3.2 BACKFILLING AND COMPACTION

- A. Base aggregate used for construction of working platforms shall be placed in lifts not exceeding 8 inches loose depth, and compacted to a sufficient density to support anticipated equipment loads (e.g., prevent rutting), to the satisfaction of the Engineer. Density testing shall not be required, unless otherwise requested by the Engineer.
- B. Compaction shall begin immediately after the material is spread.
- C. Apply additional water over the materials, as necessary, to achieve proper compaction.

3.3 MANAGEMENT OF DEBRIS AND WASTE MATERIALS

- A. Excess soil resulting from excavation and trenching activities shall be stockpiled onsite in accordance with Section 02280.
- B. The Contractor shall be responsible for preventing the off-site movement of all waste materials, spills, etc., resulting from the construction process, and shall be responsible for any consequences of any such off-site movement of the material.

END OF SECTION

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PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies the technical requirements for the sediment cap material to be placed as shown on the Drawings. Placement of sediment cap material shall proceed consistent with the alignments, grades, and cross sections shown or indicated on the Drawings or detailed in the Specifications.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Contractor Operations Plan
- C. Section 01330: Contractor Site Safety Plan
- D. Section 01560: Protection of Environment
- E. Section 01580: Existing Utilities and Subsurface Features
- F. Section 02100: Mobilization and Site Preparation
- G. Section 02120: Piling Removal
- H. Section 02145: Bathymetric Survey
- I. Section 02280: Stockpiling

1.3 REFERENCES

- A. ASTM D422: Standard Test Method for Particle-Size Analysis of Soils
- B. U.S. Army Corps of Engineers, Portland and Seattle Districts; U.S. Environmental Protection Agency, Region 10; Oregon Department of Environmental Quality, Washington State Department of Ecology and Department of Natural Resources. November 1998. *Dredged Material Evaluation Framework for the Lower Columbia River Management Area*.
- C. Franson, M.H., ed. 1992. *Standard Methods for the Examination of Water and Wastewater*. American Public Health Association, American Water Works Association, and Water Environment Federation, Washington D.C. 18th Edition, pp. 5-10 to 5-15 (Standard Method 5310B).
- D. Franson, M.H., ed. 1995. *Standard Methods for the Examination of Water and Wastewater*. American Public Health Association, American Water Works

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SEDIMENT CAP MATERIAL

Association, and Water Environment Federation, Washington D.C. 19th Edition, Standard Method 2540E.

- E. U.S. Environmental Protection Agency (EPA). April 1998. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW 846), Fifth Edition.
- F. Krone, C.A., D.W. Brown, D.G. Burrows, R.G. Bogar, S. -L. Chan, and U. Varanasi. 1989. A method of analysis for butyltin species in measurement of butyltins in sediments and English sole livers in Puget Sound. Marine Environmental Research 27: 1-18.

1.4 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.
- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) a detailed description of the proposed methods and means and construction sequencing to be used to perform the Work. The plan shall include, but not be limited to, details of the Contractor's plan and equipment to be used to accomplish the following work activities: 1) material and equipment storage and haul routes; 2) placement procedures with a list of equipment proposed to complete the Work in both the shallow and deep water cap areas; 3) and monitoring procedures and equipment to ensure accurate placement of cap material in shallow and deep water.
- C. Contractor shall submit as part of the Environmental Monitoring Plan (Section 01330) a plan for monitoring water quality during construction of the sediment cap. The monitoring equipment, monitoring frequency, and action levels to be utilized during placement of cap material shall be specified in the water quality monitoring plan.
- D. The Contractor shall submit samples and test results of imported materials intended for use as cap material to the Engineer with enough lead time to allow the Contractor to obtain the necessary dredging and associated permits upon approval.
- E. The Contractor shall submit the cap material source information including, if appropriate, a contact name, address, phone number for each product and/or source shall be submitted to the Engineer for approval at the same time as the test results.
- F. The Contractor shall submit the qualifications of the testing laboratory to the Engineer for approval at the same time as the testing results.

1.5 QUALITY ASSURANCE

- A. Testing and sampling of the material proposed for use in the sediment cap shall be performed as outlined in the Dredged Material Evaluation Framework (DMEF) for the Lower Columbia River Management Area. At a minimum, a Tier I evaluation shall be performed to determine if the material qualifies for unconfined aquatic disposal based on exclusionary status. If the amount of information on the material proposed for use as cap material is not adequate, further sampling and analysis of the material is required.
- B. If additional testing is required, Tier IIA and Tier IIB sediment testing protocols shall be utilized. Tier III testing (biological testing) shall be performed if material proposed for use in the sediment cap contains chemicals of concern at concentrations that exceed the screening guidelines presented in the DMEF.
- C. Tier IIA and Tier IIB sampling and testing for compliance includes, but is not limited to:
 - 1. Grain Size: Sieve analysis for acceptance of gradation shall be performed using ASTM D422 (modified), unless otherwise specified. Hydrogen peroxide shall not be used in preparations for grain-size analysis.
 - 2. Total Volatile Solids (TVS): Standard Method 2540E contained in the 19th Edition of *Standard Methods of the Examination of Water and Wastewater*.
 - 3. Total Organic Carbon (TOC): Standard Method 5310B contained in the 18th Edition of *Standard Methods of Examination of Water and Wastewater*. The method may be modified for sediment samples.
 - 4. Chemicals of Concern: EPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Fifth Edition.
 - a. Metals: SW 846 Methods 6010B/6020A/7000 Series.
 - b. Organometallic compounds in interstitial water: Krone Method.
 - c. Polynuclear aromatic hydrocarbons, phenols and phthalates: SW 846 Method 8270C.
 - d. Chlorinated hydrocarbons: SW-846 Method 8260.
 - e. Pesticides and PCBs: SW-846 Methods 8081/8082.
- D. The Contractor shall collect split samples or perform additional testing at the Engineer's discretion and if appropriate for each imported material to be utilized in the sediment cap.

PART 2 PRODUCTS

2.1 GENERAL

- A. Materials shall be of the quality, size, shape, gradation, or equal to that specified herein.

2.2 SEDIMENT CAP MATERIAL

- A. The material to be used for construction of the sediment cap shall be an imported, clean, granular material free of roots, organic material, contaminants, and all other deleterious and objectionable material.
- B. The material shall be at least 80% fine- to medium-grained sand. The individual particles shall be predominantly angular in shape.
- C. The material should not contain greater than 5% TVS. If the material contains greater than 5% TVS, then the material shall be subject to further testing as described in Part 1.5.C. of this section before it can be utilized for unconfined aquatic disposal.
- D. Material that does not qualify for unconfined aquatic disposal as defined in the DMEF for the Lower Columbia River Management Area will be rejected.

PART 3 EXECUTION

3.1 GENERAL

- A. Prior to cap placement activities, the Contractor shall remove pilings, dolphins, and debris as per Sections 02100 and 02120.
- B. The Contractor shall protect utilities and subsurface features during cap placement activities in accordance with Section 01580.
- C. Sediment cap material shall be placed within the tolerances established or within reasonably close conformity with the alignment grade and cross-sections indicated on the Drawings, described in the Specifications, or as established or directed by the Engineer. Material placed above or outside the designated lines and grades without being directed by the Engineer to do so shall be removed at the Contractor's expense.
- D. Contractor shall inform and satisfy himself as to the character, quantity, and quality of all material to be placed. If the material does not satisfy the quality and performance requirements specified herein, the Contractor shall obtain material that does meet the requirements at the Contractor's expense.

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SEDIMENT CAP MATERIAL

- E. The Contractor shall identify and verify with the Drawings, the required lines, levels, contours, and datum locations. Any discrepancies shall be immediately reported to the Engineer. See Section 02145 for bathymetric surveying requirements.
- F. Contractor shall make all work areas safe. Contractor shall cease work in an area until all unsafe conditions have been made safe. See Section 01330.
- G. Contractor shall provide safe access to the cap area for any inspections that may be required during cap placement activities.

3.2 PLACEMENT OF SEDIMENT CAP MATERIAL

- A. The Contractor shall utilize the most appropriate methods, equipment, and placement rates for placement of sediment cap material in each area identified on the Drawings.
- B. Placement of sediment cap material shall be accomplished such that the deposited material forms a layer of the specified thickness over the area to be capped. The thickness of the sediment cap material shall not exceed 125% of the thickness specified on the Drawings. The thickness of the sediment cap material shall not be less than the thickness specified on the Drawings.
- C. Placement of the cap material shall be conducted in a controlled and accurate manner. The techniques employed for placement should result in a gradual buildup of cap material. Sudden discharges of large volumes of sand that result in a cap thickness that exceeds the allowable tolerances shall be avoided.
- D. The Contractor shall avoid using equipment and placement rates that result in the displacement of and/or excessive mixing with the river sediments to be capped.
- E. The Contractor shall inform and satisfy himself that sediment capping material has been placed to the specified thickness, grades, and locations specified in the Drawings by monitoring the placement of cap material. Monitoring may be accomplished by performing bathymetric surveys prior to, during, and after placement or by other acceptable means such as sediment core sampling and sediment profiling camera. See Section 02145 for bathymetric survey requirements.

3.3 WATER QUALITY MONITORING

- A. The Contractor shall be responsible for preventing, to the extent practicable, the off-site movement of all waste materials, spills, etc., resulting from the construction process, and shall be responsible for any consequences of any such off-site movement of the material.

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- B. The Contractor shall monitor water quality down-gradient of the work zone to determine the impacts of the Work. At a minimum, total suspended solids (TSS) and dissolved oxygen (DO) should be monitored. If the TSS one-hundred feet down-gradient of the work area is 10% greater than background and/or if the DO drops below 5 milligrams per liter, then cap placement operations should be suspended until conditions improve.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies the technical requirements for the adsorbent cap material to be placed as shown on the Drawings. Placement of adsorbent cap material shall proceed consistent with the alignments, grades, and cross sections shown or indicated on the Drawings.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Construction Operations Plan
- C. Section 01330: Contractor Site Safety Plan
- D. Section 01560: Protection of Environment
- E. Section 01630: Storage and Protection
- F. Section 02100: Mobilization and Site Preparation
- G. Section 02120: Piling Removal
- H. Section 02145: Bathymetric Survey

1.3 REFERENCES

- A. ASTM D422: Standard Test Method for Particle-Size Analysis of Soils
- B. ASTM D2216: Moisture Content and Density

1.4 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.
- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) a detailed description of the proposed methods and means and construction sequencing to be used to perform the Work. The plan shall include, but not be limited to, details of the Contractor's plan and equipment to be used to accomplish the following work activities: 1) material and equipment storage and haul routes; 2) placement procedures with a list of equipment proposed to

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ADSORBENT CAP MATERIAL

complete the Work; 3) and monitoring procedures and equipment to ensure accurate placement of adsorbent cap material.

- C. The Contractor shall submit descriptive technical data on the adsorbent cap material. The submittal shall include all material properties specified under Part 2 Products. The submittal also shall include a copy of any standard manufacturer's warranties for the products.
- D. The Contractor shall provide to the Engineer a certificate stating the name of the manufacturer(s), product name(s), style number(s) and other pertinent information to fully describe the material. The certification shall state that the furnished products meet the requirements of this Specification as evaluated under the manufacturer's quality control program. A person having legal authority to bind the manufacturer shall attest to the certification.
- E. The Contractor shall provide test data demonstrating adsorbent cap material meets the specified requirements.

1.5 DELIVERY AND STORAGE

- A. Materials delivered and placed in storage shall be protected from the weather, dirt, dust, or other contaminants.
- B. See Section 01630 for additional storage and protection requirements.

PART 2 PRODUCTS

2.1 ADSORBENT CAP MATERIAL

- A. The adsorbent material must be an adsorbent particularly formulated for removing oil, grease, and other sparingly-soluble organic materials from water.
- B. The adsorbent shall be dimensionally stable. The product will not disperse into, swell, or soften during long-term exposure to organic contaminants. It shall exhibit constant porosity and permeability during use as shown by constant pressure drop across an adsorbent container during its life.
- C. The adsorbent shall be 100% activated clay and shall not contain activated carbon, anthracite coal, or other "support materials" or filler.
- D. The following product formulations are not acceptable for this application given their published tendency to swell, soften, or disperse into organic liquids over a time schedule comparable to this project duration.
 - 1. Dialkyl dimethyl organoclays including di(hydrogenated tallow) dimethyl ammonium bentonite and dimethyl dioctadecyl ammonium

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- 2. bentonite (CAS Numbers 68953-58-2 and 73138-28-0, respectively).
- 2. Benzyl organoclays including dimethyl benzyl (hydrogenated tallow) ammonium bentonite and methyl benzyl di(hydrogenated tallow) ammonium bentonite (CAS Numbers 71011-24-0 and 68153-30-0, respectively).
- E. Analogs formulated from other clay minerals including hectorite and montmorillonite also are prohibited.
- F. The adsorbent capping material shall have the following physical properties.
 - 1. Grain Size: U.S. Standard Sieve 2 to 30 Mesh
 - 2. Bulk Density: 42 to 48 pounds per cubic foot (46 pounds per cubic foot average)
 - 3. Moisture Content: 1% or less

PART 3 EXECUTION

3.1 GENERAL

- A. Prior to cap placement activities, the Contractor shall remove pilings, dolphins, and debris as per Sections 02100 and 02120.
- B. The adsorbent cap material shall be placed within the tolerances established or within reasonably close conformity with the alignment grade and cross-sections indicated on the Drawings, described in the Specifications, or as established or directed by the Engineer. Material placed above or outside the designated lines and grades without being directed by the Engineer to do so shall not be compensated.
- C. Contractor shall inform and satisfy himself as to the character, quantity, and quality of all material to be placed. If the material does not satisfy the quality and performance requirements specified herein, the Contractor shall obtain material that does meet the requirements at the Contractor's expense.
- D. The Contractor shall identify and verify with the Drawings, the required lines, levels, contours, and datum locations. Any discrepancies shall be immediately reported to the Engineer. See Section 02145 for bathymetric survey requirements.
- E. Contractor shall make all work areas safe. Contractor shall cease work in an area until all unsafe conditions have been made safe. See Section 01330.
- F. Contractor shall provide safe access to the cap area for any inspections that may be required during cap placement activities.

3.2 PLACEMENT OF ADSORBENT CAP MATERIAL

- A. The Contractor shall utilize the most appropriate methods, equipment, and placement rates for placement of adsorbent cap material in each area identified on the Drawings.
- B. Placement of sediment cap material shall be accomplished such that the deposited material forms a layer of the specified thickness over the area to be capped. The thickness of the adsorbent cap material shall not exceed 120% of the thickness specified on the Drawings. The thickness of the adsorbent cap material shall not be less than the thickness specified on the Drawings.
- C. Placement of the cap material shall be conducted in a controlled and accurate manner. The techniques employed for placement should result in a gradual buildup of cap material. Sudden discharges of large volumes of material that result in a cap thickness that exceeds the allowable tolerances shall be avoided.
- D. The Contractor shall avoid using equipment and placement rates that result in the displacement of and/or excessive mixing with the river sediments to be capped.
- E. The Contractor shall inform and satisfy himself that the adsorbent cap material has been placed to the specified thickness, grades, and locations specified in the drawings by monitoring the placement of cap material. Monitoring may be accomplished by performing bathymetric surveys prior to, during, and after placement or by other acceptable means such as sediment core sampling and sediment profiling camera. See Section 02145 for bathymetric survey requirements.

3.3 WATER QUALITY MONITORING

- A. The Contractor shall be responsible for preventing, to the extent practicable, the off-site movement of all waste materials, spills, etc., resulting from the construction process, and shall be responsible for any consequences of any such off-site movement of the material.
- B. The Contractor shall monitor water quality downgradient of the work zone to determine the impacts of the Work. At a minimum, total suspended solids (TSS) and dissolved oxygen (DO) should be monitored. If the TSS one-hundred feet downgradient of the work area is 10% greater than background and/or if the DO drops below 5 milligrams per liter, then cap placement operations should be suspended until conditions improve.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies the technical requirements for the armor stone to be placed as shown on the Drawings. Placement of armor stone shall proceed consistent with the alignments, grades, and cross sections shown or indicated on the Drawings or detailed in the specifications.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Contractor Operations Plan
- C. Section 01330: Contractor Site Safety Plan
- D. Section 01560: Protection of Environment
- E. Section 02100: Mobilization and Site Preparation
- F. Section 02140: Surveying

1.3 REFERENCES

- A. ASTM D422: Standard Test Method for Particle-Size Analysis of Soils
- B. U.S. Army Corps of Engineers, Portland and Seattle Districts; U.S. Environmental Protection Agency, Region 10; Oregon Department of Environmental Quality, Washington State Department of Ecology and Department of Natural Resources. November 1998. Dredged Material Evaluation Framework for the Lower Columbia River Management Area.
- C. ASTM C535 Standard Test Method for Resistance to Degradation of Large -Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- D. ASTM D5821 Standard Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
- E. ASTM D3744 Standard Test Method for Aggregate Durability Index

1.4 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.

- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) a detailed description of the proposed methods and means and construction sequencing to be used to perform the Work. The plan shall include, but not be limited to, details of the Contractor's plan and equipment to be used to accomplish the following work activities: 1) material and equipment storage and haul routes; 2) placement procedures with a list of equipment proposed to complete the Work; 3) and monitoring procedures and equipment to ensure accurate placement of the armor stone.
- C. Contractor shall submit as part of the Environmental Monitoring Plan (Section 01330) a plan for monitoring water quality during construction of the sediment cap. The monitoring equipment, monitoring frequency, and action levels to be utilized during placement of cap material shall be specified in the water quality monitoring plan.
- D. The Contractor shall submit samples and test results of imported materials intended for use as cap material to the Engineer for approval seven (7) calendar days prior to placement of cap material.
- E. The Contractor shall submit the cap material source information including, if possible, a contact name, address, phone number for each product and/or source shall be submitted to the Engineer for approval seven (7) calendar days prior to placement of cap material.
- F. The Contractor shall submit the qualifications of the Testing Laboratory to the Engineer for approval seven (7) calendar days prior to placement of cap material.

1.5 QUALITY ASSURANCE

- A. The Contractor shall collect split samples or perform additional testing at the Engineer's discretion for each imported material to be utilized for armor stone.

PART 2 PRODUCTS

2.1 GENERAL

- A. Materials shall be of the quality, size, shape, gradation, or equal to that specified herein.
- B. The Contractor may, at its option, utilize imported material with different gradation and quality characteristics than specified herein if such material is suitable for its intended use, satisfies the general requirements and intent of this Contract, and is acceptable to the Engineer.

2.2 ARMOR STONE

- A. All stone shall be durable angular material as approved by the Engineer. Stone shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. It shall be free from cracks, blast fractures, bedding, seams, and other defects that would tend to increase its deterioration from natural causes. Inspections for cracks, fractures, seams, and defects shall be made by visual examination. If, by visual examination, it is determined that 20 percent or more of the stone produced contains hairline cracks, then all stone produced by the means and measures which caused the fractures shall be rejected. A hairline crack that is defined as being detrimental shall have a minimum width of 0.1 mm and shall be continuous for one-third the dimension of at least two sides of the stone.
- B. The stone shall be clean and adequately free from all foreign matter. Any foreign material adhering to or combined with the stone as a result of stockpiling shall be removed prior to placement.
- C. Quarry operations shall be conducted by the Contractor in a manner that shall produce stone conforming to the requirements specified and may involve selective quarrying, handling, processing, blending, and loading as necessary.
- D. Storage of stone materials subsequent to shipment from the quarry and prior to permanent placement in the required work shall be subject to approval of the Agency.
- E. Stones should be cubic in shape, with sharp angular edges. Defining "a" as the length of the long axis through any stone, and "c" as the length of the shortest axis perpendicular to "a", the following shall apply:

Percent of stones having a smaller ratio	Ratio "a"/"c"
70	2.5
85	3.0
100	3.5

- F. The weight of stones for various size riprap shall meet the following:

**SECTION 02230
ARMOR STONE**

6-inch Cobble		
Percent of Stones Lighter By Weight	Maximum Stone Weight (pounds)	Minimum Stone Weight (pounds)
100	36	15
50	11	7
15	5	2

- G. The armor stone gradation shall conform to the following requirements.

<u>U.S. Standard Sieve Size</u>	<u>Percent Fines by Weight</u>
6-inch	100
4-inch	70 – 80
3-inch	50 – 60
2-inch	20 – 30
1.5-inch	10 – 20

PART 3 EXECUTION

3.1 GENERAL

- A. Contractor shall inform and satisfy himself as to the character, quantity, and quality of all material to be placed. If the material does not satisfy the quality and performance requirements specified herein, the Contractor shall obtain material that does meet the requirements at the Contractor's expense.
- B. The Contractor shall identify and verify with the plans, the required lines, levels, contours, and datum locations. Any discrepancies shall be immediately reported to the Engineer. See Section 02140 for surveying requirements.
- C. Contractor shall make all work areas safe. Contractor shall cease work in an area until all unsafe conditions have been made safe. See Section 01330.

3.2 PLACEMENT OF ARMOR STONE

- A. The Contractor shall utilize the most appropriate methods, equipment, and placement rates for placement of armor stone in each area identified on the Drawings.
- B. Placement of armor stone shall be accomplished such that the deposited material does not disrupt or penetrate the other cap components. The Contractor shall

avoid using equipment and placement rates that result in the displacement of and/or excessive mixing with the sediment cap material.

- C. The armor stone layer shall not exceed 150% of the thickness specified on the Drawings. The armor stone layer shall not be less than the thickness specified on the Drawings.
- D. The Contractor shall inform and satisfy himself that the armor stone has been placed to the specified thickness, grades, and locations specified in the drawings

3.3 WATER QUALITY MONITORING

- A. The Contractor shall be responsible for preventing, to the extent practicable, the off-site movement of all waste materials, spills, etc., resulting from the construction process, and shall be responsible for any consequences of any such off-site movement of the material.
- B. The Contractor shall monitor water quality down-gradient of the work zone to determine the impacts of the Work. At a minimum, total suspended solids (TSS) and dissolved oxygen (DO) should be monitored. If the TSS one-hundred feet down-gradient of the work area is 10% greater than background and/or if the DO drops below 5 milligrams per liter, then cap placement operations should be suspended until conditions improve.

END OF SECTION

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PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies requirements for bank regrade, placement of turf reinforcement mat (TRM), vegetation and other Work incidental to general upland treatment as shown on the Drawings or required to accomplish the Work. Upland treatment shall proceed consistent with the alignments, grades, and cross sections shown or indicated on the Drawings, detailed in the specifications, or as required to complete other Work as shown, described, or otherwise required under this Contract.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Contractor Operations Plan
- C. Section 01330: Contractor Site Safety Plan
- D. Section 01560: Protection of Environment
- E. Section 01580: Existing Utilities and Subsurface Features
- F. Section 02100: Mobilization and Site Preparation
- G. Section 02140: Surveying
- H. Section 02240: Articulated Concrete Block
- I. Section 02610: Well Abandonment
- J. Section 02620: Well Installation or Modification
- K. Section 02630: Fencing

1.3 REFERENCES

- A. ASTM C136: Sieve Analysis of Fine and Coarse Aggregates
- B. ASTM D422: Standard Test Method for Particle-Size Analysis of Soils
- C. United States Department of Agriculture, Conservation Service Soil Survey, Classification System

- D. ASTM D4355: Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
- E. ASTM D5035: Breaking Force and Elongation of Textile Fabrics (Strip Method)
- F. ASTM D5199: Measuring Nominal Thickness of Geotextiles and Geomembranes

1.4 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.
- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) a detailed description of the proposed methods and means and construction sequencing to be used to perform the Work. The plan shall include, but not be limited to, details of the Contractor's plan and equipment to be used to accomplish the following work activities: 1) material and equipment storage and haul routes; 2) bank regrade procedures with a list of equipment proposed to complete the Work; 3) stockpiling and placement of growing medium; 4) placement of TRM; 5) vegetation; and 6) control of drainage, spills, wastes, etc.
- C. Samples and test results of imported materials intended for use as a growing medium, source information including a contact name, address, phone number for each product and/or source, and qualifications of the testing laboratory, shall be submitted to the Engineer for approval fourteen (14) calendar days prior to beginning any upland treatment activities.
- D. The Contractor shall submit manufacturers' cut sheets and product specifications for the TRM and geotextile demarcation to the Engineer for approval fourteen (14) calendar days prior to beginning any upland treatment activities.
- E. The Contractor shall submit a list of trees, shrubs, and grasses to be used for vegetation including contact name, address, phone number for each plant supplier to the Engineer for approval fourteen (14) calendar days prior to beginning any upland treatment activities.

1.5 QUALITY ASSURANCE

- A. The Contractor shall collect split samples or perform additional testing at the Engineer's discretion for each product.
- B. Sampling and testing for compliance shall be as follows:
 - 1. Growing Medium Material Testing: Sieve or Hydrometer analysis (as applicable) for acceptance of growing medium gradation shall be performed using ASTM D422, unless otherwise specified.

PART 2 PRODUCTS

2.1 GENERAL

- A. Materials shall be of the quality, size, shape, gradation, or equal to that specified herein.
- B. Contractor may, at its option, utilize imported material with different gradation and quality characteristics for growing medium than specified herein if such material is suitable for its intended use, satisfies the general requirements and intent of this Contract, and is acceptable to the Engineer.

2.2 GROWING MEDIUM

- A. Growing medium shall be an imported, clean, silt loam material free of roots, contaminants, and all other deleterious and objectionable material. The textural class shall be determined by the United States Department of Agriculture Classification System. Gradation shall be determined using hydrometer analysis according to ASTM D 422. Limits are as follows:

<u>Particle Size</u>	<u>Percentage Passing</u>
0.074 mm	70-80
0.005 mm	10-30
0.001 mm	0-10

- B. Imported topsoil material, as needed, shall be friable surface soil from the "A" horizon as determined by the United States Department of Agriculture Conservation Service Soil Survey.
- C. Total organic matter shall be at least 10% by volume. Organic matter shall be determined by the Walkley-Black sulphuric acid dichromate digestion process.
- D. The pH shall be 5.5 to 7.5.

2.3 TURF REINFORCEMENT MAT

- A. TRM shall be a machine produced mat of 100% biodegradable fiber matrix incorporated into a permanent three-dimensional netting structure.
- B. Mat top and bottom netting shall be a heavyweight UV stabilized polypropylene with 0.50-inch openings (minimum). Middle netting shall be a super heavyweight UV stabilized polypropylene with 0.50-inch openings (minimum).
- C. TRM, in an unvegetated state, must be capable of reducing soil loss to under 0.25 inches at the bottom 10% of a maximum slope of 4:1 consisting of silt loam soil for a minimum time period of 36 months.

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UPLAND TREATMENT**

- D. TRM shall be anchored with U-shaped wire staples or wooden stakes with a minimum top width of 1 inch or according to manufacturer's instructions.
- E. TRM shall at a minimum meet the following properties:

Thickness	(ASTM D 5199)	0.56 inches
UV Stability	(ASTM D 4355)**	86%
MD Tensile Strength	(ASTM D 5035)	528 psf
MD Elongation	(ASTM D 5035)	28%
TD Tensile Strength	(ASTM D 5035)	837 psf
TD Elongation	(ASTM D 5035)	12%

**ASTM D1682 (4-inch strip) Tensile Strength and % Strength Retention of material following 1000 hours exposure in Xenon-Arc Weatherometer.

MD - Machine Direction

TD - Transverse Direction

2.4 VEGETATION

- A. Upper and lower riparian areas shall consist of a combination of shrubs, trees, and grasses, according to the plant list shown on the Drawings. No trees will be planted in the lower riparian area.
- B. Plant vegetation in the densities described on the Drawings.

2.5 GEOTEXTILE DEMARCATION

- A. Geotextile demarcation shall be a pervious material, fabricated of high tensile strength and modules polypropylene, with the following minimum properties:

Grab Tensile Strength	(ASTM D 4632)	180 lbs
Percent Elongation	(ASTM D 4632)	15%
Trapezoid Tear	(ASTM D 4533)	70 lbs
Puncture	(ASTM D 4533)	75 lbs
Mullen Burst	(ASTM D 4533)	300 psi
Apparent Opening	(ASTM D 4533)	30 US Sieve No.

- B. Demarcation shall meet requirements of AASHTO M288-92 for medium survivability.

PART 3 EXECUTION

3.1 GENERAL

- A. The Contractor shall protect utilities and subsurface features during upland treatment in accordance with Section 01580.

**SECTION 02270
UPLAND TREATMENT**

- B. The Contractor shall identify and verify with the plans, the required lines, levels, contours, and datum locations. Any discrepancies shall be immediately reported to the Engineer. See Section 02140 for surveying requirements.
- C. Contractor shall make safe all work areas. Contractor shall cease work in an area until all unsafe conditions have been made safe. See Section 01330.
- D. Contractor shall provide a method(s) to control dust around the upland treatment Work area in accordance with the requirements of Section 01560.
- E. Contractor shall provide safe access to the upland treatment for any inspections that may be required during Work activities.
- F. Keep placement surfaces free of water, debris, organic matter and foreign material during upland treatment activities. No fill shall be placed on frozen surfaces.
- G. Excess soil resulting from upland treatment activities shall be stockpiled onsite in a location approved by Engineer.
- H. The Contractor shall be responsible for preventing the off-site movement of all waste materials, spills, etc., resulting from the construction process, and shall be responsible for any consequences of any such off-site movement of the material.

3.2 BANK REGRADE

- A. Bank regrade shall be completed within the tolerances established or within reasonably close conformity with the alignment grade and cross-sections indicated on the Drawings, described in the Specifications, or as established or directed by the Engineer.
- B. Contractor shall inform and satisfy himself as to the character, quantity, and distribution of all material to be excavated and backfilled. Should Contractor excavate below the designated lines and grades without being directed by the Engineer to do so, the excavation shall be backfilled with appropriate material at the Contractor's expense.
- C. Bank regrade shall be done in dry weather when possible. Contractor shall grade top perimeter of bank to prevent surface water from entering the Work area. Contractor shall assume all responsibility for removal, handling, treatment, and disposal of any surface water that enters the excavation in accordance with appropriate local, state, and federal regulations.
- D. Regrade material shall be moved with the use of mechanical or hand operated equipment, such as shovels, loaders, backhoes, bulldozers, excavators, graders, scrapers, etc., but shall not require drilling and blasting or drilling and line

breaking. Excavation by sluicing method will not be permitted unless specifically approved by Engineer.

- E. Growing medium used for construction of the upland treatment shall be placed in lifts not exceeding 10 inches loose depth, and lightly compacted to prevent sloughing. Compaction may be performed by repeated passes with a loader, excavator, bulldozer, or other methods approved by the Engineer.
- F. Apply additional water over the materials, as necessary, to improve compaction.

3.3 GEOTEXTILE DEMARCATION

- A. Geotextile demarcation fabric shall be placed over entire bank regrade prior to placement of growing medium and as shown in the Drawings.
- B. Geotextile sections shall overlap a minimum of 1-foot.

3.4 VEGETATION

- A. Vegetate the regraded bank and greenway area according to the plant list and plan as shown on the Drawings.
- B. Contractor shall place fertilizers, lime, and seed prior to placement of TRM. Use fertilizers and lime only if necessary.
- C. Contractor shall plant to the densities as noted on the Drawings. All trees, shrubs, and grasses shall conform to the plant list.
- D. No trees will be planted below the terrace, as shown on the Drawings.
- E. The initial planting shall consist of herbaceous material. Once the initial vegetation has been established, install shrubs and trees. Provide irrigation, if necessary, to ensure maximum growth of the seeded and planted material.
- F. Trees and shrubs shall be planted in alternating rows and spaced according to the Drawings.

3.5 TURF REINFORCEMENT MAT

- A. TRM shall be installed according to manufacturer's instructions.
- B. Anchor the TRM at the top of the slope with an anchor trench as recommended by the manufacturer.

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- C. Attach the downslope margin of the TRM to the ACB using the ties integrated into the ACB mat. Bury the end of the TRM in the same trench as the upslope margin of the ACB.
- D. TRM may be rolled from the top of the slope downward or from the top of the slope horizontally across the slope. Staples shall be sized and placed according to manufacturer's instructions.
- E. Staples shall be of the material and size recommended by the manufacturer for installation over loose soil. At a minimum, 0.7 staples per square yard shall be used for securing TRM to ground.
- F. All seams shall overlap a minimum of 5 inches. TRM seams shall overlap with the upslope mat over the downslope mat and the upriver mat over the downriver mat.

END OF SECTION

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PART 1 GENERAL

1.1 SUMMARY

- A. This section covers the requirements for proper stockpiling of materials on site.

1.2 RELATED SECTIONS

- A. Section 01560: Protection of the Environment
B. Section 02100: Mobilization and Site Preparation
C. Section 02200: Earthwork
D. Section 02220: Adsorbent Capping Material
E. Section 02270: Upland Treatment
F. Section 02240: Articulated Concrete Block

1.3 REFERENCES

[Not used.]

1.4 STOCKPILED MATERIALS

- A. The following materials shall be stockpiled separately:
1. Clearing and grubbing debris (See Section 02100).
 2. Import materials as needed to complete the work.
 3. Excess excavated material.
 4. Visibly contaminated excavated material, as determined by the Engineer.

1.5 SUBMITTALS

- A. All stockpile locations shall be submitted to the Engineer for approval.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

3.1 LOCATION

- A. Materials may be stockpiled at site areas that do not interfere or adversely impact work activities. Stockpiles of materials in all other areas shall be minimized and will be allowed only to the extent that:
 - 1. The stockpiles, in the sole opinion of the Engineer, will not adversely affect the area where they are located.
 - 2. The stockpiles, in the sole opinion of the Engineer, will not become further contaminated.
 - 3. Stockpiles of potentially contaminated material shall be within the area within the barrier wall and at least 200 feet from the riverbank.
- B. Segregate stockpiles from one another.

3.2 CONSTRUCTION

- A. Stockpile height shall not exceed 15 feet.
- B. Side slopes shall not be steeper than 1V on 2H.
- C. Drainage paths shall be well defined, and located to prevent erosion.
- D. Construct stockpiles in such a way so as to prevent siltation, erosion, and general loss of the materials. See Section 01560 for erosion control requirements.
- E. When removing material from stockpiles, prevent mixing with other materials.
- F. Excavate materials from stockpiles in a systematic manner.
- G. Completely cover excavated material stockpiles with tarpaulins, polyethylene sheeting, or other material approved by the Engineer to prevent storm water infiltration and wind erosion. Covering shall be securely anchored (ballasted) to the satisfaction of the Engineer. Similarly cover import material stockpiles, as necessary.
- H. Prevent uncontaminated soils and stockpiles from contact or mixing with potentially contaminated soils, stockpiles, materials, or equipment.
- I. Contractor shall transport visibly contaminated soil (as determined by the Engineer) from the point of excavation to the point of stockpiling or loading in such a manner that the contaminated soil is not placed on and does not spill or fall on "clean" areas. Contractor shall clearly stake and mark stockpiles of contaminated soil with documented identification at all times.

- J. Investigation derived waste (IDW) generated during well abandonment as described in Section 02610 will be stockpiled and covered as described above for potentially contaminated soils. The IDW will remain on site until implementation of remedial actions related to final cover of site or as directed by the STATE.

3.3 INSPECTION AND MAINTENANCE

- A. Inspect stockpile conditions at least once each day and after wind storms, rain storms, or other unfavorable events as directed by the Engineer. Document inspection results.
- B. The Contractor shall maintain the stockpile area(s) to ensure structural and functional integrity.

3.4 REMOVAL OF STOCKPILES

- A. Excess existing soils excavated during construction shall remain on-site at the completion of Work. Stockpiles shall be completely covered with tarpaulins, polyethylene sheeting, or other material approved by the Engineer. Covering shall be securely anchored to the satisfaction of the Engineer. Maintain stockpiles until mobilization is complete.
- B. Completely remove import material stockpiles, if any, at the completion of Work. Grade area to existing ground surface.

END OF SECTION

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SECTION 02400
ARTICULATED CONCRETE BLOCK

PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies the technical requirements for the articulated concrete block (ACB) erosion control mats to be installed on top of the sediment cap in areas indicated on the Drawings.
- B. The Contractor shall furnish all labor, materials, equipment, and incidentals required and perform all operations in connection with the installation of ACB erosion control mats in accordance with the lines, grades, design and dimensions shown on the Drawings and as specified herein.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Contractor Operations Plan
- C. Section 01330: Contractor Site Safety Plan
- D. Section 01450: Contractor Quality Control Plan
- E. Section 01560: Protection of Environment
- F. Section 01630: Storage and Protection
- G. Section 02100: Mobilization and Site Preparation
- H. Section 02140: Surveying
- I. Section 02145: Bathymetric Survey

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. C33: Specification for Concrete Aggregates
 - 2. C39: Compressive Strength of Cylindrical Concrete Specimens
 - 3. C150: Specification for Portland Cement
 - 4. C207: Specification for Hydrated Lime Types
 - 5. C595: Specification for Blended Hydraulic Cements
 - 6. C618: Specification for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete
 - 7. D18.25.04: Specification for Articulated Concrete Block Systems (In Design)
 - 8. D422: Particle-Size Analysis of Soils
 - 9. D448: Classification for Sizes of Aggregate for Road and Bridge Construction

SECTION 02400
ARTICULATED CONCRETE BLOCK

- 10. D698: Laboratory Compaction Characteristics of Soil Using Standard Effort
- 11. D4354: Sampling of Geosynthetics for Testing
- 12. D4355: Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water
- 13. D4533: Trapezoidal Tearing Strength of Geotextiles
- 14. D4632: Grab Breaking Load and Elongation of Geotextiles
- 15. D4751: Determining Apparent Opening Size of a Geotextile
- 16. D4833: Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
- 17. D4873: Identification, Storage, and Handling of Geosynthetic Rolls
- 18. D5101: Measuring the Soil-Geotextile System Clogging potential by the Gradient Ratio
- 19. D5567: Hydraulic Conductivity Ratio Testing of Soil/Geotextile Systems

- B. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. M288-96: Standard Specification for Geotextiles

1.4 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.
- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) a detailed description of the proposed methods and means and construction sequencing to be used to perform the Work. The plan shall include, but not be limited to, details of the Contractor's plan and equipment to be used to accomplish the following work activities: 1) material and equipment storage and haul routes; 2) placement procedures with a list of equipment proposed to complete the Work; and 3) monitoring procedures and equipment to ensure accurate placement of the ACB.
- C. The Contractor shall submit to the Engineer all manufacturer's performance research results and calculations in support of the ACB mat system and geotextile proposed for use. All calculations must be made in accordance with PART 2.1.G. of this Specification.
- D. The Contractor shall furnish manufacturer's certificates of compliance for ACB blocks and mats, revetment cable, and any revetment cable fittings and connectors to the Engineer prior to the start of mat fabrication.
- E. The Contractor shall furnish to the Engineer all manufacturer's specifications, literature, shop drawings for the fabrication of the ACB mats and any recommendations, if applicable, that are specifically related to this project, fourteen (14) days prior to assembly of the ACB mats.
- F. The Contractor shall furnish to the Engineer the manufacturer's installation instructions, including repair procedures.

SECTION 02400
ARTICULATED CONCRETE BLOCK

- G. The Contractor shall furnish to the Engineer the manufacturer's quality control requirements and procedures.
- H. Drainage layer: Samples and test results of imported materials, source information including a contact name, address, phone number for each product and/or source, and qualifications of the testing laboratory, shall be submitted to the Engineer for approval seven (7) calendar days prior to beginning any excavation activities.
- I. The Contractor shall submit the qualifications of the Testing Laboratory to the Engineer for approval seven (7) calendar days prior to beginning any placement activities.

1.5 QUALIFICATIONS

- A. The Contractor shall have a sufficient number of competent workers on the job at all times to insure the ACB installation is made in a timely and otherwise satisfactory manner.

1.6 DELIVERY, INSPECTION, AND STORAGE

- A. Geotextiles labeling, shipment, and storage shall follow ASTM D 4873. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.
- B. Each geotextile roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.
- C. During storage, geotextile rolls shall be elevated off the ground and adequately covered to protect them from the following: site construction damage, precipitation, extended ultraviolet radiation including sunlight, chemicals that are strong acids or strong bases, flames including welding sparks, excess temperatures, and any other environmental conditions that may damage the physical property values of the geotextile. The geotextile rolls shall be adequately supported so deformation of the rolls does not occur during storage.
- D. Materials delivered to the site shall be new and undamaged and shall be accompanied by certified test reports. ACB mats shall be handled in a manner recommended by the manufacturer to prevent permanent damage, distortion, and breakage of the ACB.
- E. All concrete block units shall be sound and free of defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction. Surface cracks incidental to the usual methods of manufacture, or surface chipping resulting from customary methods of handling in shipment and delivery, shall not be deemed grounds for rejection.

SECTION 02400
ARTICULATED CONCRETE BLOCK

- F. Cracks in the concrete blocks exceeding 0.25 inches in width and/or 1.0 inch in depth shall be deemed grounds for rejection.
- G. Chipping resulting in a weight loss exceeding 10% of the average weight of the concrete blocks shall be deemed grounds for rejection.
- H. Concrete blocks rejected prior to delivery from the point of manufacture shall be replaced at the manufacturer's expense. Blocks rejected at the job site shall be repaired with structural grout at the expense of the Contractor.
- I. See Section 01630 for additional storage and protection requirements.

PART 2 PRODUCTS

2.1 GENERAL

- A. All ACB mats shall be pre-manufactured as an assembly of concrete blocks, with specific hydraulic capacities, bound into mats by the use of revetment cables.
- B. Individual blocks in the ACB mats shall be staggered and interlocked for enhanced stability. The open cell blocks typically have two (2) vertical openings of rectangular cross section with sufficient wall thickness to resist breakage during shipping and installation. Parallel strands of cable shall extend through two (2) ducts in each block in a manner that provides for longitudinal binding of the blocks within the mats. Each row of blocks shall be laterally offset by one-half block width from the adjacent row so that any given block is cabled to four other blocks (two in the row above and two in the row below).
- C. The gross area of each individual block in direct contact with the protected subgrade shall be no less than one square foot. Each block shall incorporate interlocking surfaces that prevent lateral displacement of the blocks within the mats when they are lifted by the longitudinal revetment cables. The interlocking surfaces must not protrude beyond the perimeter of the blocks to such an extent that they reduce the flexibility or articulation capability of the mats or become damaged or broken when the mats are lifted during shipment or placement. Once the mats are in place, the interlocking surfaces shall prevent the lateral displacement of the blocks even if the cables should become damaged or removed. The mats must be able to flex a minimum of 25 degrees between any given row or column of blocks in the uplift direction and a minimum of 45 degrees in the downward direction.
- D. The cables shall be inserted into the mats in such a manner to form lifting loops at one end of the mat with the corresponding cable ends spliced together to form a lifting loop at the other end of the mat with sleeves approved by the Engineer.
- E. The ACB mats shall be placed on a filter fabric as specified herein.

SECTION 02400
ARTICULATED CONCRETE BLOCK

- F. The ACB blocks, cables and fittings shall be fabricated at the manufacturer's facility or another approved location into mats with a width of up to eight (8) feet and a length that is approved by the Engineer.
- G. Certification: All ACB mats will only be accepted when accompanied by documented hydraulic performance characteristics, derived from tests under controlled wave conditions. Tests must have been conducted and monitored by an institution, public or private, which is experienced in performing wave attack studies on ACB mats or similar hard-armor erosion protection products. While product testing at three (3) independent laboratories is required, one of these three tests must have been performed using full-scale units.
- H. Performance: The design of the ACB mats shall be in accordance with the analytical model to predict stability of block revetments as it is developed for the Dutch Ministry of Transport and Public Works performed by the Delft Hydraulics Laboratory in 1983 for Nicolon Industrial Textiles or Oregon State University as reported by Tekmarine, Inc., in 1984. The calculation of the performance of the ACB mats under wave attack is based on the positive interaction of the individual blocks. The influence of friction and block motion on the stability of the mattress must have been deduced from the results of large-scale model tests performed by an institution experienced in conducting such tests. The analytical model for determining the ACB mat system stability includes the calculation of the pressure on top of the slope as a function of the wave characteristics and the water depth, the calculation of the maximum pressure difference across the cover layer as a function of the pressure on top of the slope and the characteristics of the granular filter (if present) and the ACB mattress, and the calculation of the friction between adjacent blocks and the influence of the block motion on the pressure difference across the ACB mattress. Parameters to be considered in design of the ACB mattress system include:

<u>Design Wave Height</u>	<u>Wave Period</u>	<u>Slope Angle</u>
4 feet	2.6 seconds	5H:1V

- I. This item shall consist of furnishing and installing ACB mats in multiple sections with wave design properties specific to each section as shown on the Drawings.
1. The ACB mat at the organoclay locations shall be an integral unit with stainless steel cables that can be removed as a single unit for maintenance purposes.
- J. The mats shall be stable as determined in Section 2.1.G of this Specification with a minimum safety factor of 1.5 for the conditions presented in Table 02400-1:

SECTION 02400
ARTICULATED CONCRETE BLOCK

Table 02400-1 ACB Mat Design Parameters					
Parameter	Area 1	Area 2	Area 3	Area 4	Area 5
Design Wave Height	4.0 feet	3.5 feet	4.0 feet	3.0 feet	3.5 feet
Slope Angle	5H:1V	5H:1V	7H:1V	7H:1V	7H:1V
Wave Period	2.1 sec	2.6 sec	2.6 sec	2.6 sec	2.6 sec

2.2 CONCRETE BLOCKS

- A. The concrete blocks shall be constructed from the following cementitious materials. Cementitious materials shall conform to the following applicable ASTM specifications:
1. Portland Cements - Specification C 150, for Portland Cement.
 2. Blended Cements - Specification C 595, for Blended Hydraulic Cements.
 3. Hydrated Lime Types - Specification C 207, for Hydrated Lime Types.
 4. Pozzolans - Specification C 618, for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete.
- B. Aggregates shall conform to the following ASTM specifications, except that grading requirements shall not necessarily apply:
1. Normal Weight - Specification C 33, for Concrete Aggregates.
- C. At the time of delivery to the work site, the units shall conform to the physical requirements prescribed in Table 02400-2 below.

Table 02400-2 Physical Requirements			
Compressive Strength Net Area Minimum psi		Water Absorption Maximum, lb/ft ³	
Average of 3 units	Individual Unit	Avg. of 3 units	Individual Unit
4,000	3,500	10	12

- D. Durability. The manufacturer shall satisfy the purchaser by proven field performance that the concrete units have adequate durability even if they are to be subjected to a freeze-thaw environment.
- E. Sample and test units in accordance with ASTM-D 6684-01, Standard Specifications for Materials and Manufacture of Articulated Concrete Block (ACB) Revetment Systems.

SECTION 02400
ARTICULATED CONCRETE BLOCK

2.2 CABLES

- A. There are two (2) types of revetment cables and fittings: the polyester cables for the majority of the cap and the stainless steel cable for those areas where organoclay caps NAPL seeps. The stainless steel-cabled mat is intended to withstand periodic removal of mattresses for maintenance in the NAPL seeps areas.
- B. Cable 1. Polyester Revetment Cable and Fittings. Revetment cable shall be constructed of high tenacity, low elongating, and continuous filament polyester fibers. Cable shall consist of a core construction comprised of parallel fibers contained within an outer jacket or cover. The weight of the parallel core shall be between 65% and 70% of the total weight of the cable. The revetment cable shall have the following physical characteristics:

Nominal Cable Diameter	Approximate Average Strength	Minimum Weight per 100 feet	Maximum Weight per 100 feet
¼-inch	3,700 pounds	2.47 pounds	2.74 pounds
5/16-inch	7,000 pounds	3.99 pounds	4.42 pounds
3/8-inch	10,000 pounds	4.75 pounds	5.26 pounds
½-inch	15,000 pounds	8.93 pounds	9.90 pounds

1. Elongation requirements specified below are based upon stabilized new, dry cable. Stabilization refers to a process in which the cable is cycled fifty (50) times between a load corresponding to $200D^2$ and a load equal to 10%, 20% or 30% of the cable's approximate average breaking strength. Relevant elongation values are as shown in the table below. The tolerance on these values is $\pm 5\%$.

	Percent Breaking Strength		
	10%	20%	30%
Permanent Elongation (while working)	0.7	1.8	2.6
Elastic Elongation	0.6	1.4	2.2
Total Stretch	1.3	3.2	4.8

2. The revetment cable shall exhibit good to excellent resistance to most concentrated acids, alkalis and solvents. Cable shall be impervious to rot, mildew and degradation associated with marine organisms. The materials used in the construction of the cable shall not be affected by continuous immersion in fresh or salt water.
3. Selection of cable and fittings shall be made in a manner that insures a safe design factor for mats being lifted from both ends, thereby forming a catenary. Consideration shall be taken for the bending of the cables around hooks or pins during lifting. Revetment cable splicing fittings shall be selected so that the resultant splice shall provide a minimum of 60% of the minimum rated cable strength. Fittings such as sleeves and stops shall be aluminum and

SECTION 02400
ARTICULATED CONCRETE BLOCK

washers shall be galvanized steel unless otherwise shown on the Drawings.

- C. Cable 2. Stainless Steel Revetment Cable and Fittings. Revetment cable shall be constructed of preformed stainless steel cable. The cables shall be made from individual wires and strands that have been formed during the manufacture into the shape they have in finished cable.
1. Cable shall consist of a core construction comprised of six (6) or seven (7) wires wrapped within seven (7) or nineteen (19) wire strands. The revetment cable shall have the following physical properties:

Nominal Cable Diameter	Approximate Average Strength	Minimum Weight per 100 feet	Maximum Weight per 100 feet
1/8-inch	1,700 pounds	2.8 pounds	2.9 pounds
3/16-inch	3,700 pounds	6.2 pounds	6.5 pounds
1/4-inch	6,100 pounds	10.6 pounds	11.0 pounds
3/8-inch	13,300 pounds	23.6 pounds	24.3 pounds

2. Cable fittings such as sleeves and stops shall be aluminum, and washers shall be galvanized steel.
3. Selection of cable and fittings shall be made in a manner that insures a safe design factor for mats being lifted from both ends, thereby forming a catenary. Consideration shall be taken for the bending of the cables around hooks or pins during lifting. Revetment cable splicing fittings shall be selected so that the resultant splice shall provide a minimum of 75% of the minimum rated cable strength.

2.3 GEOTEXTILE

- A. The geotextile filter shall meet the minimum physical requirements listed in Table 02400-3 of these Specifications. Consultation with the manufacturer is recommended.
- B. The geotextile fiber shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic, if necessary, to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The edges of the geotextiles shall be finished to prevent the outer fiber from pulling away from the geotextiles.
- C. The Contractor shall furnish the Engineer manufacturer's certified test results showing actual test values obtained when the physical properties are tested for compliance with the Specifications.
- D. During all periods of shipment and storage, the filter fabric shall be protected from direct sunlight, ultraviolet rays and temperatures greater than 140 degrees Fahrenheit. To the extent possible, the fabric shall be maintained wrapped in its protective covering.

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ARTICULATED CONCRETE BLOCK

- E. Final acceptance of the filtration geotextile by the Engineer shall be dependent upon the geotextile performance when tested in accordance with ASTM D5105, Standard Test Method for Measuring the Soil-Geotextile System Clogging by the Gradient Ratio test or the Hydraulic Conductivity Ratio test. Soil characteristics such as grain size, gradation, and plasticity shall be determined for every 200,000 square feet of geotextile installed, or for each source of borrow material used during construction. Significant differences in soil characteristics shall require further performance testing by either the Gradient Ratio or the Hydraulic Conductivity Ratio tests at the discretion of the Engineer. The locations for which the material to be tested is extracted shall be approved by the Engineer. The Contractor shall provide the site-specific soil and modified proctor curves for the site-soil, at his own expense, to the manufacturer. The manufacturer shall be responsible for the performance of the test by a certified independent laboratory experienced in performing such test. The test shall be performed under the actual field soil conditions or as otherwise required by the Engineer.
- F. At the time of installation, the filter fabric shall be rejected if it has been removed from its protective cover for over 72 hours or has defects, tears, punctures, flow deterioration, or damage incurred during manufacture, transportation or storage. With the acceptance of the Engineer, a torn or punctured section of fabric shall be repaired by placing a filter fabric patch over the damaged area prior to placing the mats. The patch shall be large enough to overlap a minimum of three (3) feet in all directions.
- G. In the event pre-assembled panels of fabric are required, the panels of filter fabric shall be sewn together at the manufacturer's facility or another approved location to form sections as recommended by the manufacturer.

SECTION 02400
ARTICULATED CONCRETE BLOCK

Table 02400-3 Minimum Physical Requirements for Geotextile			
Property	Units	Acceptable Values	Test Method
Grab Tensile Strength	Pounds	200 (in any principle direction)	ASTM D4632
Grab Elongation	%	30 (in any principal direction)	ASTM D4632
Puncture	Pounds	115	ASTM D4833
Trapezoid Tear	Pounds	95	ASTM D4533
Mullen Burst	psi	400	ASTM D3786
Apparent Opening Size	U.S. Standard Sieve Size	100	ASTM D4751
Permittivity	1/sec	0.5	ASTM D4491
Ultraviolet Degredation	percent at 500 hours	70	ASTM D4355

2.4 DRAINAGE FILL

- A. Drainage fill shall consist of washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel meeting ASTM D448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 8 sieve.
- B. The Contractor shall collect split samples or perform additional testing at the Engineer's discretion for each imported fill product.
- C. Sampling and testing for compliance shall be as follows:
 - 1. Material Testing: Sieve analysis for acceptance of aggregate gradation shall be performed using ASTM D422, unless otherwise specified.
 - 2. Material Sample: The sample of the material selected for testing shall be made by the Contractor's Testing Laboratory and approved by the Engineer. The sample shall be representative of the material to be imported.

PART 3 EXECUTION

3.1 GENERAL

- A. ACB mats shall be installed starting at the downstream end of the project to the upstream end so the geotextile joints are shingled to direct flow over the joint and to prevent undermining.

3.2 FOUNDATION PREPARATION

- A. Areas on which filter fabric and ACB blocks are to be placed shall be constructed to the lines and grades shown on the Drawings and to the tolerances specified in the Contract Documents, and approved by the Engineer.
- B. Grading. The slope shall be graded to a smooth plane surface to ensure that intimate contact is achieved between the slope face and the geotextile (filter fabric), and between the geotextile and the entire bottom surface of the ACB blocks. All slope deformities, roots, grade stakes, and stones which project normal to the local slope face must be regraded or removed. Broad undulations in the channel's surface are to be retained when applying the sediment cap ACB.
- C. Place drainage fill in a single lift where shown on the Drawings and compact as required by the Engineer.
- D. Excavation and preparation for anchor trenches, side trenches, and toe trenches or aprons shall be done in accordance to the lines, grades and dimensions shown in the Contract Drawings. The anchor trench hinge-point at the top of the slope shall be uniformly graded so that no dips or bumps greater than 0.5 inches over or under the local grade occur. The width of the anchor trench hinge-point shall also be graded uniformly to assure intimate contact between all ACB blocks and the underlying grade at the hinge-point.
- E. Inspection. Immediately prior to placing the filter fabric and ACB blocks, the prepared area shall be inspected by the Engineer, the owner's representative, and by the manufacturer's representative. No fabric or blocks shall be placed thereon until that area has been approved by each of these parties.

3.3 PLACEMENT OF GEOTEXTILE

- A. Filter fabric, or filtration geotextile, as specified in Part 2.3, shall be placed within the limits shown on the Drawings.
- B. To the extent practicable, the filtration geotextile shall be placed directly on the prepared area, in intimate contact with the subgrade, and free of folds or wrinkles. The geotextile shall not be walked on or disturbed when the result is a loss of intimate contact between the ACB block and the geotextile or between the geotextile and the subgrade. The geotextile filter fabric shall be placed so that the upstream strip of fabric overlaps the downstream strip. The longitudinal and transverse joints shall be overlapped at least two (2) feet. The geotextile shall extend at least one foot beyond the top and bottom revetment termination points. If ACB blocks are assembled and placed as large mattresses, the top lap edge of the geotextile should not occur in the same location as a space between ACB mats unless the space is concrete filled.

SECTION 02400
ARTICULATED CONCRETE BLOCK

- C. If it is not practical to place the geotextile prior to installing the ACB mats, the geotextile shall be attached directly to the ACB mats in a manner that allows for overlapping of the geotextile after placement of the ACB mats.

3.4 PLACEMENT OF ACB MATS

- A. ACB block/mats, as specified in Part 2.1 of these Specifications, shall be constructed within the specified lines and grades shown on the Drawings.
- B. The ACB blocks shall be placed on the filter fabric in such a manner as to produce a smooth plane surface in intimate contact with the filter fabric. No individual block within the plane of placed ACB blocks shall protrude more than one-half inch or as otherwise specified by the Engineer. To ensure that the ACB blocks are flush and develop intimate contact with the subgrade, the blocks shall be "seated" with a roller or other means as approved by the Engineer.
- C. If assembled and placed as large mattresses, the ACB mats shall be attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position by the use of a crane or other approved equipment. The equipment used should have adequate capacity to place the mats without bumping, dragging, tearing or otherwise damaging the underlying fabric. The mats shall be placed side-by-side and/or end to end, so that the mats abut each other. Mat seams or openings between mats greater than two (2) inches shall be filled with grout. Whether placed by hand or in large mattresses, distinct changes in grade that results in a discontinuous revetment surface in the direction of flow shall require a grout seam at the grade change location so as to produce a continuous surface.
- D. Anchor trenches and side trenches shall be backfilled and compacted flush with the top of the blocks. The integrity of a soil trench backfill must be maintained so as to ensure a surface that is flush with the top surface of the ACB blocks for its entire service life. Toe trenches shall be backfilled as shown on the Contract Drawings. Backfilling and compaction of trenches shall be completed in a timely fashion. No more than 500 lineal feet of placed ACB blocks with non-completed anchor and/or toe trenches shall be permitted at any time.
- E. Finishing. The cells or openings in the ACB blocks shall be backfilled and compacted immediately with suitable material to assure that there are not voids and so that compacted material extends from the filter fabric to one-inch above the surface of the ACB block. Backfilling and compaction shall be completed in a timely manner such that no more than 500 feet of exposed mats exist at any time.
- F. Consultation. The manufacturer of the ACB blocks/mats shall provide design and construction advice during the design and initial installation phases of the project, when required.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. Numerous monitoring wells exist at the site as shown on the Drawings. The wells shall be protected to the fullest extent possible; however, where wells are located within the area of work and whose damage cannot otherwise be avoided, said wells shall be properly abandoned, upon approval by the Engineer or as noted on the Drawings.
- B. Only those wells noted on the Drawings to be abandoned or specifically designated by the STATE in writing shall be abandoned.
- C. Perform monitoring well work in accordance with OAR 690-240 and as specified herein.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Construction Operations Plan
- C. Section 01550: Decontamination
- D. Section 01560: Protection of the Environment
- E. Section 01580: Existing Utilities and Subsurface Features
- F. Section 02100: Mobilization and Site Preparation
- G. Section 02140: Surveying
- H. Section 02330: Upland Treatment
- I. Section 02620: Well Installation or Modification

1.3 REFERENCES

- A. Oregon Administrative Rules (OAR), Water Resources Department, Chapter 690, Division 240: *Construction and Maintenance of Monitoring Wells and other Holes in Oregon*, April 2002.

1.4 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.
- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) details of the Contractor's plan, materials, and equipment for abandonment of monitoring wells.

- C. Submit Monitoring Well Construction Notice (Start Card) to the Oregon Water Resources Department (OWRD) region office before commencing the abandonment of any monitoring well, as required by OAR 690-240-0090. Copies of notices shall also be submitted to the Engineer.
- D. Submit Well Abandonment Report to the STATE including documentation on how wells were abandoned, abandonment forms, and a discussion of IDW management. Record the condition of the well casing for each well, including its appearance and any degradation of the casing material.
- E. Submit Monitoring Well Report (Monitoring Well Log) for each monitoring well abandoned, as required by OAR 690-240-0095 and 690-240-0135(6). Each log shall be certified as correct by signature of the monitoring well constructor. Submit to the OWRD within 21 calendar days after the completion of the abandonment of the monitoring well. Provide copies to the Engineer.

1.5 QUALIFICATIONS

- A. Any person who constructs, alters, or abandons monitoring wells shall have a Monitoring Well Constructor License or work under the supervision of a licensed Monitoring Well Constructor, in accordance with OAR 690-240.
- B. Licensed individuals shall display their license, if requested.

PART 2 PRODUCTS

2.1 GROUT SLURRY

- A. Grout slurry used to abandon monitoring wells shall conform to the requirements of OAR 690-240-0130.

PART 3 EXECUTION

3.1 PROTECTION

- A. Existing wells shall be protected to the fullest extent possible and in accordance with Section 01580. Wells shall not be abandoned without prior approval by the Engineer. Wells not approved for abandonment that are damaged by the Contractor shall be repaired or replaced at the Contractor's expense.

3.2 ABANDONMENT

- A. Abandon wells in accordance with OAR 690-240-0135.
- B. Abandonment shall require the borehole to be completely redrilled to a minimum of the original diameter. All casing, screen, annular sealing material, drill cuttings, debris, and filter pack material shall be removed prior to sealing. Care shall be taken to minimize damage to casing and screen, as these materials may

be reused at a later date. Stockpile waste materials on-site at a location approved by the Engineer.

- C. Grout slurries shall be mixed in the proper proportions as required by OAR 690-240-0130 and placed in the bore hole in such a manner as to prevent excessive shrinkage, water loss, chemical breakdown, or bridging.
- D. Grout slurries shall be placed from the bottom up by a grout pipe to avoid segregation or dilution of the sealant. The discharge end of the grout pipe shall be submerged in the grout to avoid breaking the seal while filling the annular space.
- E. The abandonment procedure shall be recorded on a form provided by or previously approved by the OWRD. The form shall include, as a minimum, all requirements listed in OAR 690-240-0095 and 690-240-0135(6).
- F. IDW shall be properly drummed for disposal and stored on-site in a location designated by the Engineer.

END OF SECTION

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PART 1 GENERAL

1.1 SUMMARY

- A. Monitoring wells shall be located as shown on the Drawings, or according to the Engineer.
- B. Perform monitoring well work in accordance with OAR 690-240 and as specified herein.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Construction Operations Plan
- C. Section 01550: Decontamination
- D. Section 01560: Protection of the Environment
- E. Section 01580: Existing Utilities and Subsurface Features
- F. Section 02100: Mobilization and Site Preparation
- G. Section 02140: Surveying
- H. Section 02330: Upland Treatment
- I. Section 02610: Well Abandonment

1.3 REFERENCES

- A. Oregon Administrative Rules (OAR), Water Resources Department, Chapter 690, Division 240: *Construction and Maintenance of Monitoring Wells and other Holes in Oregon*, April 2002.

1.4 SUBMITTALS

- A. Contractor shall submit all required items under provisions of Section 01300 and as described herein.
- B. Contractor shall submit as part of the Construction Operations Plan (Section 01320) details of the Contractor's plan, materials, and equipment for construction of monitoring wells.
- C. Submit Monitoring Well Construction Notice (Start Card) to the Oregon Water Resources Department (OWRD) region office before commencing the construction of any monitoring well, as required by OAR 690-240-0090. Copies of notices shall also be submitted to the Engineer.

- D. Submit Monitoring Well Report (Monitoring Well Log) for each monitoring well constructed to the State, the Engineer, and as required by OAR 690-240-095.

1.5 QUALIFICATIONS

- A. Any person who constructs, alters, or abandons monitoring wells shall have a Monitoring Well Constructor License or work under the supervision of a licensed Monitoring Well Constructor, in accordance with OAR 690-240.
- B. Licensed individuals shall display their license, if requested.

PART 2 PRODUCTS

2.1 CASING

- A. All monitoring wells shall be a nominal 2 inches inside diameter with flush-threaded joints.
- B. For monitoring wells located in areas of known contamination, the casing shall be constructed of 304 stainless steel and shall conform to the requirements of OAR 690-240-115.
- C. For monitoring wells located upgradient of areas of known contamination, the casing shall be constructed of Schedule 40 polyvinyl chloride pipe and shall conform to the requirements of OAR 690-240-115.

2.2 MONITORING WELL SCREEN, FILTER PACK, AND FILTER PACK SEAL

- A. Monitoring well screen, filter pack, and filter pack seal shall conform to the requirements of OAR 690-240-126.
- B. Monitoring well screen shall be of the same nominal diameter and material as the casing with a slot size of 0.010 inches.
- C. Filter pack shall consist of U.S. No. 10-20 clean silica sand, overlain by one to two feet of finer grained sand.
- D. Filter pack seal shall consist of No. 8 grind (or approved equivalent) sodium bentonite installed as a slurry or dry, or bentonite pellets or chips installed dry.

2.3 ANNULAR SEALANT

- A. Annular sealant shall conform to the requirements of OAR 690-240-0130.
- B. Annular sealant may be a neat cement, sodium bentonite, or cement/bentonite slurry.

PART 3 EXECUTION

3.1 PROTECTION

- A Existing wells shall be protected to the fullest extent possible and in accordance with Section 01580. Wells shall not be installed without prior approval by the Engineer.
- B Monitoring wells shall be protected in conformance with OAR 690-240-0110.

3.2 INSTALLATION

- A. Install wells in accordance with OAR 690-240-0100.
- B. Contractor or its subcontractor shall provide all materials, equipment, and labor necessary to install fully functional monitoring wells, as described herein.
- C. Drilling shall be conducted using a hollow stem auger. The use of drilling fluids is not permitted. Potable water shall only be allowed as a drilling fluid. Use of grease or oil-based lubricants to prevent binding on the drill rod or auger joints is not permitted. Solidified, edible vegetable oil may be used in place of petroleum-based products.
- D. Drilling depth will be a minimum of 20 feet below ground surface.
- E. Grout slurries shall be mixed in the proper proportions as required by OAR 690-240-0130 and placed in the bore hole in such a manner as to prevent excessive shrinkage, water loss, chemical breakdown, or bridging.
- F. Grout slurries shall be placed from the bottom up by a grout pipe to avoid segregation or dilution of the sealant. The discharge end of the grout pipe shall be submerged in the grout to avoid breaking the seal while filling the annular space.
- G. Monitoring wells completed above ground shall be protected with security casings. A protective metal casing shall be installed around the well. The monitoring well shall be fitted with lockable compression cap. The protective casings shall have a lockable lid.
- H. To prevent contamination between wells, drilling equipment shall be cleaned after each well installation by one of the following methods:
 - 1. Detergent washing and rinsing with potable water.
 - 2. High pressure hot water cleaning.
 - 3. Steam cleaning.
- I. IDW will be managed as specified in Section 02280.

3.3 MONITORING WELL DEVELOPMENT

- A. Monitoring well development shall be in conformance with OAR 690-240-0131.

- B. Each well shall be developed with a bailer, or submersible pump until the evacuated water is clear and free of suspended solids.
- C. Development activities shall continue until groundwater representative of the aquifer is obtained.
- D. Well development water shall be managed as IDW described in Section 3.4 Waste Management.

3.4 WASTE MANAGEMENT

- A. IDW shall be properly drummed for disposal and stored on-site in a location designated by the Engineer.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers the installation of a permanent fence and the placement of temporary construction fences.
- B. A six-foot-high chain-link security fence exists around the entire perimeter of the property.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01320: Construction Operations Plan
- C. Section 01560: Protection of the Environment
- D. Section 01580: Existing Utilities and Subsurface Features
- E. Section 02100: Mobilization and Site Preparation
- F. Section 02140: Surveying
- G. Section 02330: Upland Treatment

1.3 REFERENCES

- A. Chain Link Fence Manufacturers Institute Product Manual.
- B. ASTM Standards:
 - 1. A90 - Test Method for Weight of Coating on Iron and Steel Articles with Zinc or Zinc Alloy Coatings.
 - 2. A 370 - Mechanical Testing of Steel Products.
 - 3. F 552 - Terminology Relating to Chain Link Fencing.

1.4 SUBMITTALS

- A. Permanent fencing.
 - 1. Submit shop drawings and product data.
 - 2. Include plan layout, spacing of components, accessories, hardware, and anchorages.

PART 2 PRODUCTS

2.1 PERMANENT FENCE

- A. Components: Match existing fence components. Replacement components shall comply with the Chain Link Manufacturers Institute and the applicable ASTM standards for Steel Wire Chain Link Fence .

2.2 TEMPORARY CONSTRUCTION FENCE

- A. Components shall be steel posts and PVC fabric, or as approved by the engineer.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Permanent fence.
 - 1. At the completion of the Project, the permanent fence shall be relocated and attached to the end of the existing fence near the FWDA to the end of the existing fence near the southern property corner. Installation of this section shall result in a complete fence enclosure of the site.
 - 2. Install framework, wire mesh, and accessories to match existing fences, replacing those components that were damaged or destroyed during salvage activities.
- B. Temporary construction fence.
 - 1. Temporary construction shall be used by the Contractor to barricade or to restrict access to staging areas or areas where construction activities are underway.
 - 2. Post spacing, setting, and fabric attachment shall be appropriate to provide a sturdy and durable temporary construction fence.
 - 3. Fence material shall have a high visibility coating. Minimum height of fence shall be 4 feet.
 - 4. The fence shall be maintained as necessary until completion of activities requiring the fencing.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers activities necessary to demobilize from the site. At a minimum, work activities shall include the following:
 - 1. Decontamination and removal of all Contractor equipment and materials from site.
 - 2. Collection and disposal of all Contractor-generated waste materials.
 - 3. Removal of Contractor's field office specified in Section 01610.
 - 4. Disconnection and removal of temporary utilities specified in Section 01610.
 - 5. Site restoration.

1.2 RELATED SECTIONS

- A. Section 01300: Contractor Submittals
- B. Section 01550: Equipment and Material Decontamination
- C. Section 01610: Construction Aids
- D. Section 01700: Project Documentation and Closeout
- E. Section 01800: Site Maintenance
- F. Section 02140: Surveying

1.3 SUBMITTALS

- A. Submit contract documentation and closeout items in accordance with Section 01700.
- B. Submit record drawings in accordance with Sections 02140 and 02145.

PART 2 PRODUCTS

[Not used.]

PART 3 EXECUTION

- A. All facilities, equipment, and materials in the exclusion and contamination reduction zones shall be decontaminated as specified in Section 01550 prior to final removal.
- B. All temporary utilities shall be disconnected or discontinued at such time when no longer required for site operations or until other site activities deem them necessary. Five (5) working days written notice prior to any disconnection of temporary utilities or termination of services shall be provided to the Engineer.

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DEMobilIZATION**

- C. The Contractor's field office shall be removed from the site at such time that it is no longer required with prior approval by the Engineer.
- D. Any erosional or drainage damage or damage to existing site features which resulted from Contractor activities shall be repaired to conditions existing at the beginning of the work at the Contractor's expense. Restore/repair all removed fencing sections.
- E. Drainage pathways shall be restored to lines and grades existing at the beginning of the Work or to alignments approved by the Engineer.
- F. The Contractor shall complete final site cleaning activities as specified in Section 01800.

END OF SECTION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
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SEATTLE, WA 98101

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- 1-TITLE SHEET SITE LOCATION. 1 OF 7.
- 2-EXISTING SITE LAYOUT. 2 OF 7.
- 3-GENERAL SITE WORK. 3 OF 7.
- 4-CROSS-SECTIONS. 4 OF 7.
- 5-CONSTRUCTION DETAILS. 5 OF 7.
- 6-UPLAND BANK REGRADE. 6 OF 7.
- 7-VEGETATION PLAN & DETAILS. 7 OF 7.